THE BANGLADESH ECONOMIC REVIEW

Ttl changes with v. 2 no 3

Volume II January 1974 Number 1

Articles

Notes and Comments

The Quarterly Journal of
ANGLADESH INSTITUTE OF DEVELOPMENT ECONOMICS

Manuscript and editorial correspondence should be addressed to the Board of Editors, *The Bangladesh Economic Review,* Adamjee Court, Motijheel Commercial Area, Dacca-2, Bangladesh. Style instructions for guidance in preparing manuscript in acceptable form will be provided upon request.

The Bangladesh Economic Review

Volume II January 1974 Number I

Articles

Notes and Comments

Book Review

Book Reviewed

Comparative Cost Structure—A Study of Selected Manufacturing Industries of Bangladesh

by

ZAID BAKHT AND SIDDIQUR RAHMAN OSMANI*

I. INTRODUCTION

The small beginning that was made in industrialising Bangladesh during the Pakistani era was characterised by a high degree of inefficiency in the use of scarce resources. It was essentially an import substituting type of industrialisation with more concern for saving foreign exchange than for reaping the benefit of comparative advantage.

The foreign exchange constraint may once again lead to investment in import substituting sectors with little concern for efficient allocation of resources. In order to minimise wastage of resources, the investment pattern must conform to the comparative cost structure of various sectors. The purpose of the present paper is to identify the comparative cost conditions of various industries in the manufacturing sector of Bangladesh. It is hoped that the findings of this paper, by pointing out the sectors where investment can reap relatively greater benefit will help in the future planning for allocation of resources in Bangladesh.

Section II describes the scope and methodology of analysis. The results of the analysis are given in Section III, where some major industries of Bangladesh are ranked according to their comparative cost ratios. An attempt is made in Section IV to find out whether these comparative cost ratios conform to the factor proportions. Finally, in Section V a summary of findings is presented and some tentative policy conclusions are drawn.

---

* The authors are Staff Economists at the Bangladesh Institute of Development Economics. They are thankful to all their colleagues at the Institute for their useful comments on an earlier draft. Thanks are also due, in particular, to Dr. S.R. Bose, Acting Director and Dr. M. Alamgir, Senior Research Economist, for their help and guidance all through the research on this paper. Deficiencies of this paper, if any, however, belong to the authors alone.

II. METHODOLOGY

The present study estimates comparative cost ratio for 16 important manufacturing industries of Bangladesh over the period 1964-1969. The industries have been selected primarily on the basis of value added. The selected industries contributed on the average around 58 percent of the total industrial value added and 52 percent of total industrial output of Bangladesh over these five years.

Certain industries ranking high in terms of value added, however, could not be included in the study either because data on price of competing imports are not available or because the domestic product is qualitatively so inferior or varying that any comparison with the price of the imported goods would have been meaningless. For example, cigarette industry which ranks second in terms of value added could not be included in the study because the different brands of domestically produced cigarettes are qualitatively so different from one another and from the imported brand that neither any estimate of comparative cost nor any measure of per unit cost of production could be meaningfully obtained.

The major source of data on the cost condition of the domestic product is the unpublished materials on the Census of Manufacturing Industries (CMI). The CMI classifies industries under broad categories so that in many instances a single industry covers a large number of different products. In case of such industries producing a multitude of products no proper estimate of the per unit cost of production can be obtained. Data were, therefore, collected on industries at a further level of disaggregation so that the selected industry either produces a single item or there is one main item of production that constitutes bulk of the value of production. For example, instead of studying the basic metal industry as a whole three specific items namely M. S. Rod and Bar, M. S. Billets and G. I. Wire were selected. The industries for which data at a disaggregated level were not available could not be included in the study.

Comparative cost in the present context has been defined as the ratio of the per unit cost of domestic product to the cif price of competing imports. While deciding industrial investment policy one should compare the social cost of producing a particular product to that of importing it from abroad. In estimating the comparative cost ratio, therefore, it is necessary that all costing be made at scarcity price so that the cost ratio reflects the true sacrifice incurred by the society in producing the product at home instead of importing it from abroad. Accordingly, the following measures have been adopted.

All indirect taxes paid on the various domestic and imported raw materials have been excluded.

All import prices have been corrected on the basis of 100 percent over valuation of the domestic currency. The extent by which the then Pakistani currency was overvalued had been estimated differently in different studies. Nurul Islam in his article on comparative cost [2] assumed 50 percent over valuation of the Rupee over the period 1951-66. Some other studies have revealed far greater extent of overvaluation. These estimates along with the premium fetched by the bonus voucher tend to suggest that an assumption of 100 percent overvaluation of the Rupee over the period 1964-69 may not be far out of line with reality.

In calculating employment cost, however, the ruling wage rate was accepted as the social cost of employing labour. The rationale behind this is as follows. The different estimates of shadow wage that have so far been made, along with other relevant facts, clearly indicate that the scarcity price of labour in a country like Bangladesh lies at a point which is far below the ruling wage rate which itself stands at such a low level from the point of view of nutrition and basic requirement that any proposition of giving the workers a wage rate lower than the ruling one would be not only ethically indefensible but also institutionally infeasible. The market wage rate, therefore, is the *ipsofacto* social cost of labour since anything lower than this is not considered socially desirable. Accordingly we have accepted the existing wage rate as the social cost of labour.

The detailed methodology followed in estimating the per unit cost of domestic product and the price of competing imports is discussed below.

As mentioned earlier, each of the industries included in the present study produces either a single product or there is one main item of production that constitutes the major portion of the value of production. In case of the latter group of industries comparative cost was estimated for the main product. It was difficult, however, to separate the cost of production of the main item from the CMI returns, because costs are recorded under different heads (employment, fuel and electricity cost) for all the products together.

In order to disaggregate the part of the total cost which is attributable to the main product, a simple method was followed. It was assumed that the percentage of mark-up over per unit cost of production is the same for all products in any industry which in turn means that the cost of production of each item is proportional to the price. From this it follows that if the main product constitutes T% of the total value of production then T% of the total cost is attributable to the main product[1].

---

[1] Total cost of production and not the individual cost elements was divided according to this percentage. Although arithmetically the two would give the same result, the latter procedure would be faulty because logically it would not follow from the above assumption.

To the extent that percentage of mark-up varies from product to product, the above assumption will give a distorted picture. But since the proportion of the main product in the total value of production for the selected industries is overwhelmingly high[2], the cost of production of other items will be of very small magnitude so that the distortion is unlikely to be significant.

In estimating per unit cost of production, 6 elements of cost were identified and these are (i) employment cost (ii) fuel and electricity cost (iii) miscellaneous cost (iv) cost of raw materials (v) capital consumption and (vi) normal profit. Of these, data on the first three were obtained from the CMI. The rest have been estimated in the following manner.

Cost of Raw Materials

From the CMI data on cost of raw materials, all taxes and duties that have been paid on the various domestic and imported raw materials were excluded. The tax rates were obtained from the different issues of *Pakistan Customs Traiff* and national budget. The CMI figures on the cost of imported raw materials were also corrected for overvaluation of the domestic currency.

Capital Consumption

The depreciation figures given in the CMI returns are sometimes used as an approximation of capital consumption. But there are certain compelling reasons why such an approximation should be avoided as far as possible. Capital consumption actually refers to the physical deterioration of the capital assets, while depreciation rates prescribed by the income tax authority are often tampered with considerations of differential incentives. As a result, the depreciation rate structure is likely to diverge very widely from the actual pattern of physical decay. Secondly, depreciation rates are applied to the book-value of assets, which is the sum of investments made in different years, each instalment of investment being valued at the price of the period in which the investment is made. Consequently, the book-value does not refer to any single price and as such it is not a very useful economic entity. What is required is the real or replacement cost of capital defined as the sum of investments made in different periods but valued at the price of the period for whose capital stock we are interested. Physical deterioration rates should be applied to these replacement costs to get the capital consumption figures at current year's prices.

---

[2] Three out of the 16 selected industries have single item of production. Of the other 13, proportion of the main product in the total value of production is 80 percent or above for 9 industries. In case of two industries it is between 60 and 70 percent. The proportion is below 60 percent in case of only one industry.

An attempt is made here to correct for both these deficiencies . The detailed methodology[3] is given in [1].

In order to get the capital consumption of period t (C_t), the net replacement cost of capital at the beginning ($\overset{b}{R_t}$) and at the end ($\overset{e}{R_t}$) of that period were calculated, according to the method outlined in [1]. The difference gives gross investment (I_{Gt}) for that period minus capital consumption, i. e.,

$$\overset{e}{R_t} - \overset{b}{R_t} = I_{Gt} - C_t = I_{Nt} \text{.........................(1)}$$

(I_{Nt} is investment at period t, net of capital consumption)

Now gross investment in period t can be obtained from the CMI data on book values at the beginning ($\overset{b}{B_t}$) and end ($\overset{e}{B_t}$) of that period and the depreciation allowance (D_t) for that period.

Thus,

$$\overset{b}{B_t} - \overset{e}{B_t} = I_{Gt} - D_t = I'_{Nt},$$

(I'_{Nt} is the investment at period t, net of depreciation)

$$\text{or, } I_{Gt} = I'_{Nt} + D_t \text{.................................(2)}$$

Substituting (2) in (1) for I_{Gt}, and making necessary rearrangement one gets the following,

$$C_t = I'_{Nt} - I_{Nt} + D_t.$$

In this way, the capital consumption figures for each type of asset for each of the years from 1964-65 to 1968-69 were obtained.

Normal Profit

Normal profit needs to be included in the cost of production as an element of cost representing the reward for entrepreneurial activity. But there seems to be no satisfactory basis of calculating normal profit accurately which can be found only in the equilibrium of a perfectly competitive economy. So, in the absence

---

[3] The methodology followed is the one due to Khan and MacEwan [5], with some minor changes.

of anything else, a rule of thumb had to be used. The various Tariff Commission Reports of Pakistan[8], use a certain percentage of the manufacturing cost of production as a measure of fair profit. Taking a rough average of these percentages, 10 percent of the manufacturing costs of production (which is the sum of raw materials cost, employment cost, fuel and electricity charges, capital consumption and miscellaneous costs) was assumed to be the normal profit.

Price of Imports

Price of imports varies according to the source of origin. Much of this price differential is accounted for by the differential quality of the same product produced in different countries. In particular, the goods originating from developed countries are likely to be of better quality. If the per unit cost of domestic production is compared with the per unit price of imports from the developed countries, the difference in quality will distort the cost comparison[4]. In order to minimise such distortion, and to compare goods of more or less similar quality, we have calculated the per unit cif price of imports of developing ECAFE region from the countries of the same region, from the data obtained from [11]. The price thus obtained was then converted into domestic currency.

The ECAFE data were available for 1964-65 and 1966-67 only. For 1965-66 an arithmetic average of these two years' price was taken and for 1967-68 and 1968-69 it was assumed that prices remained the same as in 1966-67.

Finally, a few words are necessary to explain the international price of jute goods. In jute textiles we considered both hessian and sacking. The per unit cost of production is a weighted average of these two. So, in the international price also, we took an weighted average of the prices of hessian and sacking the weights being their share in domestic production, so that the weights for both sides of comparative cost ratio are the same.

III. MAJOR FINDINGS OF THE STUDY

The important results of this study are presented in this section. The comparative cost structure of the manufacturing sector of Bangladesh has been shown at three levels of aggregation. First, the cost ratios are given for the individual industries. Then the industries are classified into three major groups, namely, consumer goods, intermediate goods and the capital goods sectors, and the comparative cost structure of these categories are analysed. Finally, an aggregate

---

[4] To be precise, it will underestimate the cost disability and overestimate comparative advantage

comparative cost ratio is estimated to get some idea about the general level of cost disability of the overall manufacturing sector.

Table I shows the comparative cost ratios for different industries for five years from 1964-65 to 1968-69.

The movement of the cost ratios over the five years does not indicate any steady pattern for any industry except for coconut oil. In case of coconut oil the comparative cost position appears to have deteriorated over time. Most industries indicate a worsening of their cost ratio in the last year as compared with the first. Only six industries have been able to improve their cost ratios from the initial to the terminal year, although the improvement is not quite substantial.

Since no significant trend can be observed for most of the industries, the fluctuations over time can be treated as primarily of a random nature. As such, a better and more representative picture should emerge from an average of the cost ratios for the five years. Table II shows the average cost ratios of the industries which have been ranked in order of their competitive position.

TABLE I

COMPARATIVE COST RATIO*

Description	1964-65	1965-66	1966-67	1967-68	1968-69
Tea ...	0.397	0.551	0.598	0.699	0.384
Sugar	2.321	1.389	1.800	2.500	3.000
Jute Textile ...	0.603	0.497	0.698	0.767	0.764
Cotton Yarn ...	0.858	0.662	0.737	0.715	0.755
Fertilizer ...	1.272	0.909	0.912	0.720	0.969
Cement ...	0.739	0.885	1.129	0.911	1.063
Paper ...	0.982	0.910	1.473	1.377	0.990
Newsprint ...	0.889	1.001	0.865	0.762	0.728
Edible Oil ...	1.336	1.224	1.225	1.246	1.143
Vanaspati ...	1.366	1.207	1.136	1.289	1.335
Rayon ...			1.488	0.974	1.288
Coconut Oil ...	1.839	1.867	2.741	2.923	3.554
M. S. Rod & Bar	1.379	1.139	1.577	1.616	1.850
M. S. Billet ...	1.064		1.080		
Synthetic Resin	1.763	1.744	1.669	2.528	3.634
G. I. Wire ...		0.910		1.242	1.045

* Ratio of per unit cost of domestic production to per unit import cost.

As is observed from Table II, for six out of sixteen industries, the cost ratio is less than unity which means that the cost of production in these industries is less than the cif price of competing imports. These industries thus enjoy a comparative advantage[5]. Of these six industries comparative advantage in case of two (cement and fertilizer) is only marginal. The other four industries (tea, jute,

TABLE II

AVERAGE COMPARATIVE COST RATIO

Description	Average Cost Ratio
Tea	0.526
Jute Textile	0.666
Cotton Yarn	0.745
Newsprint	0.849
Cement	0.945
Fertilizer	0.956
G. I. Wire	1.066
M. S. Billet	1.072
Paper	1.146
Edible Oil	1.235
Rayon	1.250
Vanaspati	1.267
M. S. Rod & Bar	1.512
Sugar	2.202
Synthetic Resin	2.268
Coconut Oil	2.285

---

[5] It should be noted that this comparative advantage is relative not to the whole world, but to the developing ECAFE region which is the origin of competing imports considered in this study.

cotton yarn and newsprint), however, have an overwhelming degree of cost advantage. Unit cost of production in these industries is 15 to 48 percent lower than the cif price of similar imports. Tea industry enjoys the greatest comparative advantage followed by jute. But this result needs to be interpreted with some caution. The quality of tea produced in Bangladesh does not fare well in comparison with tea produced in India and Ceylon. It is the cif price of tea from these two countries with which we have compared the domestic cost of production. This comparison between two different qualities of tea may have distorted the picture somewhat in the sense of overestimating the comparative advantage.

The majority of the industries suffer from comparative disavantage. This is not at all surprising for an economy at a relatively early stage of industrialisation. Seven industries have a unit cost of production within about 150 percent of import price and for three industries domestic cost is more than double the import price. Coconut oil is the most disadvantageous industry followed by synthetic resin and sugar.

In Tables III(A) and III(B) individual sectors are classified under the consumer goods, intermediate goods and capital goods sectors[6] and the group averages of comparative cost have been computed in two different ways. First, the cost ratio for each group is obtained as a simple average of cost ratios of all industries in that group. This is shown in Table III(A). Secondly, an weighted average of the cost ratios of different industries in each group is estimated, the weights being the value of output of the respective industries. The results are given in Table III(B).

TABLE III(A)

COMPARATIVE COST OF THREE MAIN CATEGORIES OF INDUSTRIES

(SIMPLE AVERAGE)

Description	1964-65	1965-66	1966-67	1967-68	1968-69
Consumer Goods	1.36	1.09	1.19	1.43	1.47
Intermediate Goods	1.03	0.95	1.32	1.35	1.59
Capital Goods	1.06	0.98	1.26	1.26	1.32

Unlike the ratios in Table I the simple average cost ratios in Table III(A) indicate an uniform pattern in their movement. The cost ratio for all the three categories of industries came down in the second year but rose steadily in the

---

[6] Consumer goods sector includes, Sugar, Tea, Edible Oil and Vanaspati. Capital goods sector includes M.S. Billets, M.S. Rod & Bar, G.I. Wire and Cement ; the rest of the industries are in the intermediate goods sector.

TABLE III(B)

WEIGHTED AVERAGE

Description	1964-65	1965-66	1966-67	1967-68	1968-69
Consumer Goods	1.20	0.94	1.09	1.43	1.28
Intermediate Goods*	0.74 (1.04)	0.60 (0.94)	0.77 (1.12)	0.81 (1.03)	0.80 (1.05)
Capital Goods	1.33	1.11	1.49	1.49	1.72

*The ratios within brackets exclude extreme values.

following years. No such pattern is, however, visible when the weighted average cost ratios (Table III(B)) are considered. One interesting feature of the intermediate goods sector is that while the simple average cost ratio indicates significant cost disability of this sector in certain years, the weighted average cost ratio indicates exactly the opposite. The reason behind this is that certain industries in this group which have very low comparative cost ratio, incidentally also have very high value of output. On the other hand, industries with very high cost ratios have very low weights so that when the weighted average is computed, the low-cost-ratios more than off-set the high ratios to show the whole group as highly advantageous. When these industries with high output value and low cost ratios are excluded, the weighted average cost ratio, as shown in the bracketted figures, indicate some degree of cost disability for the group in most years.

To examine the relative competitive position of the three categories of industries, an average of the five years' cost ratios are taken and this is shown in Table IV.

TABLE IV

AVERAGE COST RATIO FOR THREE MAIN CATEGORIES

	Consumer Goods	Intermediate Goods	Capital Goods
Simple Average	1.39	1.31 (1.13)*	1.15
Weighted Average	1.19	0.75 (1.08)*	1.42

*The figures within brackets exclude extreme values.

When the extreme values are excluded, the cost ratio computed by the two different methods for intermediate goods are consistently lower than those for the other categories. In case of simple average the consumer goods industry is found to be most disadvantageous. But when the weighted average is computed capital goods sector shows the highest degree of cost disability.

In general we can say that the intermediate goods sector enjoys the greatest comparative advantage in Bangladesh, although when simple average is taken including all extreme values, capital goods sector comes out at the top. One striking feature of the whole situation is that consumer goods sector never appears as the most advantageous. It clearly shows how the import substitution in consumer goods sector in the past led to an inefficient growth behind a protective wall.

Finally, an aggregate cost ratio is computed for all the industries to assess the extent of cost disability of the manufacturing sector of Bangladesh in general. The results are given in Table V.

TABLE V

AGGREGATE COMPARATIVE COST RATIO*

	1964-65	1965-66	1966-67	1967-68	1968-69
Simple Average	1.12	0.99	1.28	1.35	1.50
	(1.08)	(0.96)	(1.21)	(1.31)	(1.47)
Weighted Average	0.94	0.73	0.91	1.02	0.94
	(1.35)	(1.03)	(1.23)	(1.34)	(1.26)

*The ratios within brackets exclude extreme values.

As in the case of three broad categories of industries, the aggregate cost ratio comes down in the second year but rises in the following years when simple averages are used while no such trend is evidenced in the case of weighted averages.

Table VI shows the overall picture of the manufacturing sector in Bangladesh when an average is taken for the five years.

TABLE VI

AVERAGE AGGREGATE COMPARATIVE COST RATIO

Simple Average	1.27 (1.23)
Weighted Average	0.91 (1.26)

Simple average shows more or less than 25 percent cost disadvantage depending on whether the extreme values are included or not. But a startling result emerges in the case of weighted average. Overall manufacturing sector of Bangladesh appears to be more efficient than other countries of the developing ECAFE region. This is, however, due to the strong bias of weights in favour of one or two highly advantageous industries. Jute textiles and tea industry which have the lowest comparative cost ratios account for nearly 55 percent of the total value of production in the sixteen industries studied here. When these two industries are excluded, the overall comparative disadvantage of the manufacturing sector is almost similar in terms of both simple average and weighted average.

IV. COMPARATIVE COST RATIOS AND FACTOR PROPORTIONS

According to conventional economic theory, a country is expected to have comparative advantage in those sectors which use more of its abundant factor. As such, Bangladesh with its abundant labour and scarce capital should have comparative advantage in the more labour-intensive sectors. In this section, an attempt is made to test the above hypothesis in the context of Bangladesh, on the basis of estimates of comparative cost structure of sixteen manufacturing industries.

The test has been performed with the help of the usual regression analysis. It is examined, to what extent and in which direction factor proportions affect the comparative cost ratios. Factor proportion is defined as the capital-labour ratio represented by the ratio between the real value of capital-stock derived by the method discussed in [1] and the total employment cost which in-cludes payments to both workers and the administrative personnel.

The capital-labour ratios thus derived are, however, only an approximation. Complete accuracy could not be ensured due to the fact that the present industry categories, in most cases, do not coincide exactly with the categories of CMI. While calculating the capital-labour ratio for the newly defined categories, it becomes difficult to apply the procedure that was adopted in Section II to estimate the comparative cost ratios. For instance, it is not very meaningful to say that 80 percent of the capital stock in edible oils industry can be attributed to the production of oil, simply because oil constitutes 80 percent of the total value of production. Unfortunately, the census data do not provide any breakdown of capital stock attributable to different products of a multi-product firm—and, in most cases, such breakdown will not be technically feasible either.

The way out of this impasse was found, in making a simplifying assumption. It was assumed that the capital-labour ratio of the industry as defined in this study is the same as the corresponding industry as defined by CMI. The rationale behind this assumption is that since the industry category defined usually comprises the major portion of the industry defined by CMI, the capital-labour ratios in the two cases are not likely to be widely divergent.

The problem of defining the relevant capital-labour ratio being thus resolved, an average was taken of these ratios for the five years from 1964-65 to 1968-69. The variables included in the regression analysis are these five-yearly averages of capital-labour ratios and comparative cost ratios (Table A-3). The exercise was not done for each individual year because the year-to year variation of both factor intensity and comparative cost ratios are not very substantial and as such the relationship based on the five-yearly average of the variables is expected to be fairly representative of the entire period.

When all the sixteen industries are considered, there seems to be no statistically significant relationship between comparative cost and factor-proportions. An inspection of the scatter diagram, however, reveals that the presence of sugar industry is alone an important cause of the irregularity in the scatter. It has by now been established through some other studies[9]that sugar industry of Bangladesh is a peculiar case which defies all norms of rational economic behaviour.

Therefore, the sugar industry was excluded and a regression line was fitted with the rest of the observations. Inspite of the reduced degrees of freedom, statistically significant relationship was obtained. Double-logarithmic regression equation fitted the data best.

Putting Y for comparative cost ratio and X for capital-labour ratio, the estimated relationship can be expressed as

$$\log Y = .37562 - \underset{(.15738)}{.30506} \log X,$$

$$t = 1.94,$$

$$\text{and} \quad R^2 = .225.$$

The regression co-efficient is significant at 10 percent level. Although the degree of confidence that can be attached to the estimate is not very high in a statistical sense, and although meaningful relationship could be found only after excluding one of the observations, yet the above relationship can be accepted as broadly representative of the actual situation obtaining in the period considered.

The interesting feature of the estimated relationship is the sign of the co-efficient. There seems to exist an inverse relationship between comparative cost ratio and capital-intensity. The higher the capital-labour ratio, the lower the comparative cost ratio, i. e., the greater is the comparative advantage. This is in striking contrast with the hypothesis derived from conventional theory, namely, that Bangladesh should have comparative advantage in the labour-intensive sectors.

Such nonconformist behaviour can be explained by certain well-known factors which affect the choice of technique in a developing economy. Possibly the most important factor is the distorted structure of relative prices. Even though labour is in far more abundant supply than capital, their prices do not reflect their relative scarcities[2]. As such capital-intensive techniques are not quite as costlier than the labour-intensive ones as they ideally should have been in Bangladesh. So the distorted price structure tends to make the capital-intensive sectors more advantageous than they are likely to be in a perfect market of a labour-abundant economy.

Secondly, the capital-intensive techniques happen to be more productive than the labour-intensive ones. There is nothing intrinsic in the greater capital-intensity, however, which makes for this greater efficiency. It is only that the more efficient techniques are devised in the industrially developed countries where the factor proportion dictate that these new techniques be more capital-intensive. Since there are no similar research activities in the developing countries to devise efficient techniques suited to their factor proportions, the labour-intensive techniques used by them are usually less efficient. It is, therefore, not very surprising that the capital-intensive sectors should have a lower comparative cost even in a capital-poor country like Bangladesh.

Thus greater efficiency on the one hand and a lower cost differential than the one suggested by theory on the other, have made for lower comparative cost in the capital-intensive sectors of Bangladesh[7].

It should, however, be noted that capital-intensity alone does not explain much of the variations in the comparative cost ratios. As the co-efficient of determination (R^2) shows, capital-intensity explains just over 22 percent of these variations. This may be expected, since comparative cost does not depend on domestic factors alone. Capital-intensity affects the cost of domestic production. But the difference in the prices of importables depends on differential productivity in the various sectors of the countries of origin, internal tax and subsidy policies of those countries and many other factors. And all these in turn affect the comparative cost structure of domestic industries. As such, it is only to be expected that the capital-intensity in domestic industries will fail to account for the major portion of the variations in comparative cost ratios.

V. SUMMARY OF CONCLUSIONS

The major findings of this paper can be summarised as follows.

1. Out of the sixteen industries considered, six have a comparative advantage and the rest have a disadvantage.

2. Tea appears to be the most advantageous and coconut oil the most disadvantageous industry. However, when the differential quality of domestic and foreign tea is considered, the superiority of tea becomes suspect and the prospect of jute industry coming at the top is brightened.

3. In general, the intermediate goods sector seems to be more efficient than the consumer goods or capital goods sector, although under a particular system of averaging capital goods sector exhibits the greatest advantage.

---

[7] Nurul Islam [2], found a similar inverse relationship between comparative cost and capital-intensity for the then Pakistan as a whole. Inspite of large differences in coverage and methodology of constructing the relevant variables, similar results obtained by the two studies is indeed reassuring.

4. Consumer goods sector as a whole does not indicate greater efficiency relative to the other two sectors under any system of averaging. The highly protectionist policy followed in the past regarding the consumer goods sector has most probably led to this inefficiency.

5. The overall cost disability of the manufacturing sector in Bangladesh is of the rough magnitude of 25 percent, i. e., the average per unit cost of production is about 25 percent higher than the average per unit import cost.

6. There is an inverse relationship between comparative cost ratio and capital-labour ratio. About 90 percent confidence can be attached to this conclusion when the sugar industry is left out of consideration. It is suggested that the much greater productivity of capital intensive techniques, together with the failure of factor prices to reflect factor scarcity have made the capital-intensive sectors more advantageous in general, even in a labour-abundant, capital-poor country like Bangladesh.

Appendix

TABLE A-1

VALUE OF MAIN PRODUCT AS A PERCENTAGE OF TOTAL OUTPUT

	1964-65	1965-66	1966-67	1967-68	1968-69
Coconut Oil ...	.83	.94	.75	1.00	1.00
Vanaspati ...	.53	.61	.67	.72	.57
Paper ...	1.00	1.00	.93	.92	1.00
Newsprint ...	1.00	1.00	.81	.70	.72
Rayon ...			.39	.84	1.00
Fertilizer ...	1.00	1.00	1.00	1.00	1.00
Cement ...	1.00	1.00	1.00	1.00	1.00
Synthetic Resin ...	.90	.95	.94	.93	.91
Sugar ...	.98	.99	.99	.94	.96
M. S. Rod & Bar ...	1.00	1.00	1.00	1.00	1.00
Edible Oil ...	.60	.86	.84	.81	.93
Jute Textile ...	.91	.87	.99	.99	.99
Tea ...	.77	.88	.87	.75	.80
M.S. Billets ...	.70	.50	.88		.94
G. I. Wire ...	.62	.24	.26	.30	.33

TABLE A-2

PER UNIT DOMESTIC AND IMPORT COST

(VALUE IN TAKA)

Description	Unit	1964-65		1965-66		1966-67		1967-68		1968-69	
		Domestic	Import	Domestic	Import	Domestic	Import	Domestic	Import	Domestic	Import
Sugar	Lb.	0.65	0.28	0.50	0.36	0.54	0.30	0.65	0.26	0.93	0.31
Tea	Lb.	1.51	3.80	2.09	3.79	2.26	3.78	2.51	3.59	2.36	3.54
Edible Oil	Cwt	198.84	148.84	209.95	171.50	246.22	196.17	244.42	196.17	224.16	196.17
Vanaspati	Cwt	233.25	170.80	213.59	176.90	207.84	183.00	235.84	183.00	244.35	183.00
Rayon	Lb.					11.10	7.46	7.40	7.46	9.61	7.46
Coconut Oil	Cwt	264.73	143.96	271.00	145.18	401.31	146.40	428.00	146.40	520.30	146.40
Newsprint	Cwt	75.88	85.40	82.42	82.35	68.61	79.30	60.46	79.30	57.75	79.30
Paper	Cwt	98.28	100.04	98.30	107.97	170.67	115.90	159.65	115.90	114.78	115.90
Cotton Yarn	Lb.	3.01	3.51	2.47	3.73	2.92	3.96	2.83	3.96	2.99	3.96
Urea	Ton	767.65	603.59	565.35	621.80	583.93	640.01	461.03	640.03	620.38	640.01
Cement	Ton	121.66	164.70	143.12	161.65	179.07	158.60	144.44	158.60	168.53	158.60
M. S. Billets	Ton	1198.57	1126.36	845.99	1286.50	975.06	902.48				
M.S.Rod & Bar	Ton	1422.10	1030.90	1160.01	1018.70	1587.29	1006.50	1626.71	1006.50	1862.33	1006.50
G. I. Wire	Ton	1818.19		2053.29	2256.54	2186.04		2222.70	1789.64	2435.39	2329.78
Syn. Resin	Lb.	2.98	1.69	3.47	1.99	3.27	1.96	3.11	1.23	3.38	0.93
Jute Textile	Ton	1955.88	3244.30	1933.95	3893.70	2404.69	3443.72	1965.73	2564.52	2091.56	2737.50

TABLE A-3

COMPARATIVE COST AND CAPITAL LABOUR RATIO
(AVERAGE OF FIVE YEARS)

	Cost Ratio	Capital/Labour Ratio
Sugar	2.202	16.80
Tea	0.526	14.37
Edible Oil	1.235	8.44
Vanaspati	1.583	15.38
Rayon	1.250	24.73
Coconut Oil	2.585	3.36
Newsprint	0.849	26.34
Paper	1.146	15.37
Cotton Textile	0.745	9.85
Jute Textile	0.666	6.02
Fertilizer	0.956	37.67
Synthetic Resin	0.268	4.78
Cement	0.945	7.91
M. S. Billet	1.072	16.10
M. S. Rod & Bar	1.512	7.32
G. I. Wire	1.066	16.10

REFERENCES

1. Bakht, Z. and Osmani, S. R., Comparative Cost Structure of Manufacturing Industries of Bangladesh, Research Report (New Series) No. 12, Bangladesh Institute of Development Economics, Dacca.

2. Islam, Nurul, "Comparative Cost, Factor Proportions and Industrial Efficiency in Pakistan", *Pakistan Development Review*, Vol. VII, No. 2, Summer 1967.

3. ————, *Imports of Pakistan: Growth and Structure; A Statistical Study.* (Karachi: Pakistan Institute of Development Economics, 1967).

4. Khan, A. R., Some Problems of Choice of Techniques in a Mixed Economy. The Case of Pakistan. Misc. 50, (Karachi : Pakistan Institute of Development Economics).

5. Khan, A. R. and MacEwan, A., "A Multi-sectoral Analysis of Capital Requirements for Development Planning in Pakistan", *Pakistan Development Review*, Vol. VII, No. 4, Winter 1967.

6. Government of Pakistan, Central Board of Revenue, *Brochure on Taxation of Income and Concessions to Industries in Pakistan.* (Karachi: Central Board of Revenue, 1960).

7. ————, Central Statistical Office, *Monthly Statistical Bulletin*, July 1970.

8. ————, Tariff Commission, Reports, Various Years (Karachi: Manager of Publications).

9. Rahman, A. N. M.A., "Elasticities of Substitution in Manufacturing Industries of Bangladesh : An International Comparison", *Bangladesh Economic Review*, Vol. I, No. 2, April 1973.

10. Soligo, R. and Stern, J.J., "Tariff Protection, Import Substitution and Investment Efficiency", *Pakistan Development Review*, Vol. V, No. 2, Summer 1965.

11. UN, ECAFE, *Foreign Trade Statistics of Asia and the Far East*, Vol. V, Series A, No. 1, (New York : United Nations, 1969).

12. United States, Treasury Department, *Depreciation Guidelines and Rules*, Publication No. 456, Revised, (Washington: US Treasury Department, August 1964).

Aspects of Economic Inequality in Developing Countries

by

R. M. SUNDRUM*

I. INTRODUCTION

Economic inequality in the developing countries has become a major concern of national leaders and development economists in recent years. They have been particularly concerned with how far the pursuit of economic growth has affected the distribution of income adversely in the past or is likely to do so in the future. The presumption of a conflict between these objectives may be a hangover from the past experience of developed countries; as Simon Kuznets has shown, this experience has been for inequalities to widen in the early stages of economic growth and to narrow down only in its later stages [13. 14. 15, Chap. 4]. This generalisation, of course, describes what may be called the 'natural history' of the process, i. e., the process as it worked out in the natural course of events when economic growth occurred largely due to market forces and neither growth nor equality were actively promoted by governmental policies. The developing countries of today, however, face quite different circumstances as they seek actively to promote economic growth and greater equality; it is therefore necessary to consider a new such issues as the effects of market forces on these objectives, the effects of growth-promoting policies on inequality and the effects of equalisation policies on growth.

The discussion of these questions has been much handicapped by a severe lack of empirical data, and some analytical weaknesses. The analytical weaknesses, are the failure to break down the concept of inequality into its more basic elements, each with its own special characteristics and its own laws of motion through time; the neglect of the dynamic aspects of the processes affecting economic growth and development on the one hand, and those affecting economic inequalities on the other; and the failure to pose the problems of growth and inequality in their appropriate time perspectives.

An attempt is made in this paper to remedy these weaknesses to some extent. The study is confined to the developing countries with mixed economies, i. e., those in which a great deal of economic activity is carried out in the private sector

---

*Australian National University.

in response to market forces but also those in which government policies play a significant part. For these countries, it examines the extent and nature of economic inequalities; the factors influencing the levels and trends of such inequalities, paying special attention to those which have been somewhat neglected in the literature; and concludes with a broad survey of the effects of governmental policies on inequalities of income.

II. NATURE AND EXTENT OF INEQUALITIES

It is generally assumed that the level of inequalities in the developing countries is very high. In more than 40 developing countries, at the beginning of the First Development Decade, the average share in the national income of the richest 20% of the people was 56%—but the share of the poorest 60% was only 26%[19]. The position may be compared with data compiled by ECE for 8 industrial countries of Western Europe for the years 1962-64; according to which the richest 20% received 47% of the total income on the average, while the poorest 60% received 30% [31]. There is greater inequality in the less-developed countries than in developed countries, but the difference is not very large. In fact, as Table I shows, the differences among less-developed countries are greater than those between them as a whole and the developed countries.

Further, the differences in various parts of the income scale are more striking than the differences in overall levels of inequality. Thus, the fraction of income received by the poorest 20% is higher in the less-developed countries than in the developed countries. The higher overall inequality in the less-developed countries is mainly due to the fact that the richest 20% in these countries get a higher fraction of income than in developed countries, at the expense of the middle income groups. Simon Kuznets [16, p. 22] and Gunnar Myrdal [21] have argued that the reason for the higher share of income received by the poorest 20% in the less-developed countries is that their standard of living is already close to the subsistence level; this is primarily a consequence of the low average income of these countries rather than the degree of inequality of their income distributions. The distinction is important in any analysis of the inter-relation between economic growth and income inequality.

Table II shows the income inequalities in some Asian developing countries in terms of concentration ratios, together with corresponding data for some developed countries for comparison. Inequalities are high in the Philippines, Sri Lanka and Thailand, but quite low in others, as compared with developed market economies.

Regarding changes of inequalities over time, Mr. McNamara has cited cases in which the position has worsened [19, p. 5]. In Brazil, the share of the poorest 40% declined from 10% in 1960 to 8% in 1970, during which period, the per capita GNP increased by 2.5% per annum; this implies that there was an absolute decline in the standard of living of the lower income groups. However, the available data from most countries are so limited that no general conclusion can be drawn.

From some points of view, the real problem in many less-developed countries is not the inequality in income distribution as a whole, but the extent of poverty in an absolute sense, defined e.g., as the proportion of people living below some specified minimum standard of living. Poverty in this sense may be widespread either because the distribution of income is very unequal or because the whole country is poor. A rough idea of the way the two influences operate is shown in Table III which gives the percentage of population living below a per capita income of US $30, for different degrees of inequality and different levels of income, derived by simple interpolation from the data compiled in the World Bank study. Whatever the effects of economic growth on overall inequality, economic growth will reduce the extent of poverty.

Among developing countries, the extent of poverty has been studied most intensively in India. In 1962, a high level Study Group of the Indian Planning Commission defined the minimum standard of living as that corresponding to a per capita annual consumption level of Rs. 240 (in 1960-61 prices) at a time when the average for the whole country was Rs. 280; on this basis, the extent of poverty was estimated to be between 50 and 60%. More recently, Dandekar and Rath defined the poverty line in terms of nutritional adequacy, i. e., an expenditure level that would yield 2,250 calories per capita daily; on this basis, they estimate that 40% of the people in rural areas and 50% in urban areas were poor in 1961-62 [5]. There has been considerable controversy over the question whether the extent of poverty has risen or fallen in India in recent years. P. D. Ojha [22] and P. K. Bardhan[3] have argued that the extent of poverty in rural areas has increased in the past decade while B. S. Minhas[20] holds the contrary view. In a comprehensive study, Vaidyanathan[33] has shown that there has been some decline in the degree of inequality (as measured by the concentration ratio) but because per capita real consumption has also declined in rural areas, being about 16% lower in 1967-68 compared with 1960-61, the proportion of rural population below the minimum standard of living increased considerably during the period. This shows that the extent of poverty is highly sensitive to the average level of income. This relationship is also evident in the estimates made for the Indian Plans. The longterm perspective associated with the Fourth Five-Year Plan expected per capita consumption to increase by 42% between 1968-69 and 1980-81; assuming that income distribution remained the same, such an increase would reduce the proportion of people below the minimum standard of living from 53% to 30% [10, p. 34].

III. CAUSES OF INEQUALITIES

In searching for the causes of the great variations in inequality among developing countries, the historical pattern of inequalities must be distinguished from the changes that have occurred in the past two or three decades. Because of strong cumulative tendencies for perpetuating and magnifying inequalities of income distribution, especially acting through the distribution of wealth, present levels of inequality are due, to a great extent, to the persistence of historical patterns, which have varied greatly from country to country. The high levels of inequality in many Latin American countries and in some Asian countries such as Thailand and the Philippines have to be attributed to such historical reasons. Changes in the modern period may have reduced or accentuated such historical patterns of inequality but one general conclusion that can be drawn is that the historical patterns are more likely to have persisted, the slower the changes in the modern period, especially if the rate of growth has been small.

Among the factors operating to increase inequalities in the modern period, a factor whose significance has not been widely appreciated is that of the high rates of population growth. Countries which could barely cope with population growth rates of around 1% per annum or less had suddenly to deal with population growth rates of around 3%. Such a sharp acceleration of population growth, brought about by mortality decline with fertility remaining almost stationery at a high level, has led to high dependency ratios and large family sizes. The effect on inequality of demographic changes of this magnitude can be seen most simply as follows. Once a family has a level of income beyond its usual consumption needs, it is able to save, accumulate wealth, in both tangible and intangible forms, increase its income, save more and so on. On the other hand, a family starting with an income below its usual consumption standard, dissaves or reduces its consumption standard, leaving the next generation worse off. The effect of demographic trends has been to increase the proportion of families in the second category, both because of the increase in consumption needs and because of the smaller share of productive assets available to each member of the next generation. Further, for a variety of reasons such as greater access to education, family planning advice and supplies, higher income groups tend to have smaller family sizes. The result of these tendencies is illustrated by data from India and Indonesia in Tables IV and V. From such data, Dandekar and Rath concluded in their study of India that "there is therefore little doubt that the size of a household is an important factor in pushing it down the ladder"[5]. The relationship between household size and per capita expenditure, however, is a bit more complex. This can be seen when the same data are tabulated in a different way as shown in Table VI. We then get a U-shaped curve for average consumption as a function of household size, probably because the better-off families associate more non-family members in their households [28].

The relationship between living standards and household size reflects to some extent the changes in living standards in the course of the life cycle, i. e., the movement of individuals through various stages such as entry to labour force, marriage, setting up an independent household, having children, old age and retirement. This could have been studied more fully if information on per capita expenditure were available according to some index to the life cycle, such as age of the head of household, but such information is generally not available. The inequality of incomes or expenditures calculated from such data as are usually published is, therefore, the result of inequalities among households in the same stage of the life cycle, as well as inequalities between households in different stages. Some inferences can, however, be drawn from Indonesian data, if the size of the household itself is taken as a proxy for its life cycle stage, in small and medium-sized households, which mostly consist of family members. Table VII shows income inequalities according to household size. The typical pattern is for inequality to increase with household size in the small and medium size households and then to decline with household size in the larger households, suggesting strongly that inequality increases in the course of the life cycle.

Turning now to economic factors, the data summarized in Table II indicate that Asian developing countries do not show any systematic relationship between levels of inequality and rates of economic growth. However, a closer relationship can be seen if we distinguish among various aspects of inequality and also between the modern and traditional sectors of the economy. The overall level of inequality may then be regarded as the compound effect of inequalities within each of these sectors and the disparity between them[1]. Some recent estimates of urban-rural disparities and inequalities within the urban and rural sectors are given in Tables VIII and IX. They show that inequalities in urban areas are generally greater than in

---

[1] A simple expression of this relationship can be derived as follows. Let average income in the traditional sector be a fraction α of average income in the modern sector, and let C_1 and C_2 be the coefficients of variation of incomes in the modern and traditional sectors respectively. Then, if p is the proportion of workers in the modern sector, the coefficient of variation of all incomes, C, is given by

$$C^2 = \frac{pC_1^2 + qC_2^2\alpha^2 + pq(1-\alpha)^2}{(p+q\alpha)^2}$$

where $q = 1 - p$.

rural areas and that overall inequality is highly correlated with such inequalities and with the urban-rural and farm-nonfarm disparities. This is the conclusion reached by Harry Oshima in his comparison of inequalities in the East Asian and Southeast Asian countries. He writes, "The sources of the greater inequality in the Southeast Asian countries relative to the East Asian countries in our sample are traceable to (1) the large differentials in the level of per family income between the rural or agricultural sector and the urban or non-agricultural sector, particularly in the metropolis, (2) the large size of the rural-agricultural population relative to the urban non-agricultural population, and (3) the wide dispersion or variation in the size of family incomes in the larger cities of Southeast Asia" [23].

There are many examples of development processes leading to increased inequalities as a transitional phenomenon. One example is provided by the spread of high-yielding varieties in India. When these varieties had not been fully adopted by all wheat farmers in the selected areas, there was concern that the new programme was widening income differentials between the better-off farmers who adopted the new varieties more readily and the poorer farmers who were slower to adopt these varieties. But as adoption rates were pushed towards 100%, this cause of income differentials has become less significant.

Perhaps the most important case of rising inequalities occurring as transitional phenomena is that of education. Educational expansion has been looked upon as a means of promoting both economic development and income equality at the same time. In fact, Simon Kuznets has argued that this factor has been an important one in promoting greater equality in the more recent history of the developed countries. However, actual policies of educational development need to be examined more closely. So long as all sections of population do not have equal educational opportunities, there is the danger that the better off will take greater advantage of the limited facilities available, so that the educational system itself becomes a means of perpetuating inequalities. From his survey of a number of countries, Harold Lydall has concluded that "societies in which education is more unequally distributed will exhibit a wider dispersion of earnings than those in which it is more equally distributed [18,p.257]. The increasing concern over inequality of educational opportunities is illustrated by the report of the Indian Education Commission [8]. Also, the Presidential Commission to Survey Philippine Education reported that "at most only 10% of families can afford to send their children to college. On the other hand, 25% of families with an annual income of P3000—P5000 spent between P140 and P240 yearly on education. These could be the families who are able to send their children to private high schools. Only 2.6% of families whose annual incomes were P10,000 or more can afford a high quality education which costs, on the average, more than P1000 a year. The foregoing facts reveal that at present, educational opportunities beyond the secondary level are open only to the top 2.6% of families"[9, p. 51].

Apart from the unequal access to education, income inequalities have also been due to the great differences in earnings of workers with different levels of education. As shown in Table X, these income differentials are much greater in the less-developed countries than in more advanced countries. This difference between the two groups of countries is basically due to the greater scarcity of educated workers in the less-developed countries in the past. As educational facilities are extended more widely and as income differentials due to differences in educational levels become smaller, these sources of inequality in the less-developed countries will diminish. The present high levels of inequality due to these factors must therefore be viewed as transitional phenomena in the course of development. As Arthur Lewis put it, "Discord is part of the cost of economic development....In this world of paradoxes, one may note again that possibly the surest way to diminish the discords of development is to have still more rapid development" [1, p. 71].

Recent discussions have stressed widespread unemployment as an important cause of poverty and source of income inequality in the developing countries. This factor needs more careful analysis. In the first place, there are serious problems in measuring the extent of unemployment and underemployment by the techniques generally used. These techniques were evolved for use in the developed industrial countries and when applied to the less-developed countries tend to give rather low estimates. In the second place, there are many examples of poor people who work long hours and whose poverty is due, not to their unemployment but to their low productivity, as shown by the survey of the Lima-Callao Metropolitan Area of Peru, the results of which are given in Table XI. On the other hand those who are unemployed but not necessarily poor, such as educated young people from better-off families, who prefer to wait for more attractive jobs than they are offered and can afford to do so because they are subsidised by their families during the waiting period. Attempts to refine the concept of unemployment in the less-developed countries as a major factor underlying poverty have now come full circle with what is called the 'income approach to unemployment' which would make "work income and the circumstances in which it is derived the central subject for investigation rather than employment and unemployment as such" [29]. Unemployment which was thought to be a cause of poverty is therefore to be defined as poverty itself.

While the connection between unemployment on the one hand and income inequality or poverty on the other has not been firmly established, some economists have gone on to argue that economic growth is linked to income inequality through the effects on unemployment. This view is closely associated with the I.L.O. and the inter-agency teams organised by I.L.O. and headed by Dudley Seers, which have reported on Colombia and Ceylon [11, 12]. The weakness of this view of the problem was brought out in the 1970 Cambridge Conference on Employment Prospects in the Seventies [25]. At this conference, the new view was put forward by David Morse, the former Director-General of I.L.O. in terms of the "dethronement of the GNP" but as John White summarised the discussion of this argument, "It is not the pursuit of rapid growth which is at fault, but the pursuit of growth unrelated to objectives. What needs to be 'dethroned', therefore, is the use of the growth rate as an indicator of development" [25].

While insisting on the need to follow employment-oriented development strategies rather than growth-oriented development strategies, the I.L.O. Country Reports are themselves rather ambiguous about the relationship between output growth and employment growth. On the one hand, the Colombia Report says, "The root of the discontent with economic growth as a supreme objective has been the dawning realisation that even when it is rapid, it has generally, as in Colombia itself, been accompanied by rising unemployment and widening gaps between the rich and the poor, and between town and country—very possibly by actual increases in the numbers living below some poverty line, wherever this is drawn...To try to solve the unemployment problem by just accelerating overall economic growth is therefore to take on, voluntarily, the task of Tantalus—the target recedes as one reaches it. What is needed is to change the nature of the process of economic growth" [11]. In support of this view, the report says, "In the first place, productivity is not independent of the rate of economic growth ; the faster the rise in output, the faster tends to be rise in productivity (unless policies are adopted to prevent this happening) with the result that the impact on employment is muffled. Even if this were not happening in individual sectors, a rapid rise in the national income implies, if the government simply lets the economy rip, a particularly rapid growth in the modern sector, which already has a high output per head and does not absorb much additional labour. The expansion of this sector produces rapid increases in urban wages, unless the government has effective policies on incomes and taxes, making much more difficult the growth of output and employment". On the other hand, the report also says, "Nevertheless, there is a widespread belief that one has to make a choice between a fast growth of income and a fast increase in employment, because labour-intensive methods may involve slower rises in income in the farm or factories concerned. This way of stating the problem is however to pose a somewhat false alternative". In fact, as pointed out in the Cambridge Conference, the new strategy recommend by the I.L.O. Mission to Colombia turned out to imply a growth rate of 8% a year, which was significantly higher than the growth rates actually achieved in past years.

The argument that higher growth rates of output induce faster rises of productivity and hence slower growth of employment must be examined further. Productivity of labour increases, so that growth of employment is less than growth of output, in both developed and developing countries, especially in industry. Table XII shows that the increase in productivity for less-developed countries as a whole has been smaller than for developed market economies. Within the less-developed countries, the differences in the overall increase of productivity are mostly due to changes in the structure of industrial output, even at the 2-digit level of classification. A further point to be noted is that while growth of employment is less than growth of output, this does not imply that faster growth of output leads to slower growth of employment.

Finally we consider another major factor underlying economic inequality in the developing countries, namely their relative factor endowment. The characteristic feature of these countries is their much smaller endowment of capital relative to labour. In most market economies, the ownership of productive capital is distributed more unequally than incomes from work ; this inequality in ownership of assets is even greater in the developing countries than in the developed countries. Further, because of the greater scarcity of capital, the ratio of earnings per unit of capital to wages per unit of labour is greater in the less-developed countries. Hence, any given inequality in the ownership of capital contributes to a greater inequality in distribution of incomes in these countries. This is the main explanation of the greater share of incomes of the highest income groups in these countries. Data are not sufficient to estimate this effect, but some indication of its magnitude is given by the fact that, according to the latest (1970) edition of the U.N. *Growth of World Industry* the average share of wages and salaries of employees in manufacturing industry was 52.0% for 19 industrialised countries and only 32.6% for 45 less-developed countries. Further, within labour incomes, there exists a similar tendency for a higher level of incomes from entrepreneurial and technical skills, and a greater inequality of such incomes because these skills are concentrated amongst fewer people.

IV. GOVERNMENT POLICIES AND ECONOMIC INEQUALITY

In this final section, we consider briefly how economic inequality is or may be influenced by government policies, distinguishing these policies according to whether their main focus is on growth or on equalisation. We shall first consider the effects of growth policies on inequality and then the effects of equalisation policies both on inequality and on growth, in each case taking special account of their speed of action.

It has frequently been pointed out that the growth performance of developing countries in the sixties has been an impressive one, actually surpassing the target of the First Development Decade and confounding the pessimism of the early post-World War II years. In fact, however, such growth as has occurred was primarily due, not to the policies of the developing countries themselves, but rather to the great expansion of world trade in that period [32] ; as Arthur Lewis has put it, "this experience is very similar to what happened between 1871 and 1913 when a great many tropical countries also made great strides responding to expanding world trade" [2, p. 6]. Further, most of the high growth rates occurred in the smaller developing countries [32, p. 10]. The growth rates in the more populous countries were much more modest. As seen in the last section, these differences in growth rates did not have any systematic relationship with levels of inequality.

To the extent that government policies have actively influenced economic growth, they have generally been biased towards the extension of the modern sector rather than the modernisation of the traditional sector, and, as argued above, the effect of such a bias has been to increase income inequality, though such an increase may be a transitional phenomenon when viewed against a longer time perspective. Little, Scott and Scitovsky have indicated some of these adverse effects on equality when the extension of the modern sector has taken the form of industrialisation along import substitution lines by protective tariffs and controls [17].

Government policies to promote economic growth have also been directed towards infrastructural investment. Progress in these fields has generally been slow and in any case, the effects on growth occur only in the long run. It is only when these investments are pushed vigorously that their potential for equalisation can be realised.

While equality of opportunity may be taken as an acceptable long-term goal of equalisation policies, the approach to this goal is beset in the short run by the fact that existing inequalities of opportunity arise largely, though not wholly, from inequalities of incomes. Equalisation policies in the short-term have therefore to be pursued along two fronts, one of relaxing the effect of inequalities of incomes on inequalities of opportunities and the other of reducing income inequalities themselves.

Attempts to make the distribution of opportunities less dependent on current inequalities of income distribution have largely to be pursued by the public provision of these opportunities. The supply of public services to promote such opportunities, such as educational facilities, must be expanded. Where public resources for providing these facilities are limited, they must be directed more specifically to those lower income groups who are less able to provide them for themselves. Where provision is made for higher income groups, the cost must be recouped more fully from the beneficiaries in these groups.

Beyond these efforts, equalisation policies must focus on reduction of income inequalities, especially as they affect inequalities of opportunities. To begin with, they must be directed towards eliminating the unequal distribution of wealth, especially in agricultural land. While redistribution of existing productive capital can make a great impact on the redistribution of incomes in a relatively short period of time, it has to be supplemented by increased supply of productive assets to remedy the low productivity of labour of the lower income groups.

Policies to redirect future investment along such lines raise questions about the technique of project appraisal. If costs and benefits are measured in terms of the effects on national incomes based on existing unequal distribution of income, they would tend to favour investments benefiting higher income groups with their greater command of purchasing power ; this, in fact, is the way in which market forces by themselves influence the allocation of investment. If further deterioration in income distribution is to be avoided, this tendency must be counter-balanced by public investment and the public regulation of private investment.

Apart from policies directed towards the redistribution and accumulation of productive capital, other measures can also be taken to influence incomes more directly. The direct tax system is the principal instrument used in developed countries for this purpose. This fiscal route can be employed more intensively than it is at present. However, the scope for this approach is limited because of the narrow base of the tax system in most developing countries. The extension of the tax system to make it an effective instrument for reducing inequalities has therefore to be looked upon as a long-term measure. More significant effects on equality can be achieved in a shorter period by changes in the pattern of public expenditures.

An increase in the wages of unskilled labour relative to other incomes, if it could be achieved, would be a potent factor in improving the overall distribution of income. However, the low wages of unskilled labour are mostly due to their relative abundance and their low productivity. Attempts to raise the level of such wages artificially may only lead to adverse effects on employment. Also, where the level of wages is raised, the benefits would only accrue to those working for wage employment and may even be at the expense of self-employed workers who are generally worse off. More lasting effects on equality can be achieved in the long run if the level of wages rises as a result of capital accumulation and increasing productivity of labour.

In recent years, governments have relied considerably on programmes of employment creation in the public sector. Where this means the expansion of productive employment, it will promote both equality and growth. There is great scope for such measures, especially in building up rural infrastructure, as illustrated by the successful *kabupaten* programme in Indonesia [6]. With relatively modest outlays of capital, surplus labour in rural areas has been utilised to improve rural infrastructure, achieving substantial productivity increases in a relatively short period. Employment creation for its own sake without adding to production would also promote equality in the short run similar to an income redistribution policy. However, it may have adverse effects on growth and even equality in the long run. For example, increasing employment opportunities in urban areas may only stimulate rural-urban migration on such a scale as to increase the volume of urban unemployment. In designing policies of employment creation, it must be noted that the visibly unemployed are often not the poorest persons in developing countries, but especially in the case of educated unemployed youth, the political pressure they can exert has induced governments to cater specially for their employment opportunities.

An aspect that has to be taken into account in determining the time perspective of equalisation policies is that a more equal distribution of money incomes by itself cannot reduce economic inequality in real terms, to the same extent. Increased money incomes in the hands of poorer sections of the population can benefit them only to the extent that the structure of production is adjusted towards their consumption patterns. There are many indications that the consumption pattern of lower income groups favours labour-intensive commodities and except for food in some countries, has lower import content. In agriculture, for example, there are indications that the full development of the productive potential of the vital food-producing sector is often limited by lack of effective demand due to present inequalities of income distribution. Similarly, in industry, Little, Scott and Scitovsky have argued that production of expensive products for use by a restricted middle class in import-substituting industries has come up against the limits of the home market [17]. Hence, a reduction of income inequality will tend to promote growth by fuller use of the abundant factors and economical use of scarce factors, as demonstrated by the alternative projections of demand for the Indian Fifth Five-Year Plan, comparing the results for a more equal income distribution with those of a continuance of existing inequalities. These effects of a more equal distribution of income on the rate and pattern of growth therefore promise a new opportunity for developing countries to achieve faster growth through greater equality.

TABLE I

INCOME SHARES BY FRACTILE GROUPS

Fractile Groups	Developing Countries			Total	Developed Countries
	L. America	Africa & M.E.	Asia		
Number of Countries	15	19	6	40	8
Poorest 20%	4.89	5.93	6.29	5.59	4.08
20 — 40%	8.72	7.50	10.55	8.42	9.89
40 — 60%	11.64	9.74	14.19	11.12	16.05
60 — 80%	18.32	16.14	19.70	17.49	22.96
80 — 95%	25.52	27.20	26.24	26.43	25.47
Richest 5%	30.91	33.49	23.03	30.95	21.55
Concentration Ratio	00.484	00.509	00.402	00.484	00.416

TABLE II

CONCENTRATION RATIOS OF INCOMES AND EXPENDITURES

Country (Year)	Concentration Ratios	
	Households	Individuals
India (1961—62)[a]		0.36
(1967—68)[a]		0.31 X
Indonesia :[b]		
(excl. Jakarta, 1964-65)		0.39 X
(Java-Madura, 1967)		0.29 X
S. Korea[c]	0.26	
W. Malaysia (1957-58)[c]	0.36	
Pakistan (1963-64)[d]	0.38	
Philippines (1965)[e]	0.51	
Sri Lanka (1963)[e]	0.45	
Taiwan (1964)[e]	0.36	
Thailand (1962)[e]	0.50	
Australia (1954-55)[f]	..	0.35
Denmark (1963)[g]	0.39	
Finland (1962)[g]	0.47	
France (1962)[g]	0.52	
W. Germany (1964)[g]	0.47	
Japan (1963)[e]	0.35	
Netherlands (1962)[g]	0.44	
Norway (1963)[g]	0.36	
Sweden (1963)[g]	0.40	
U. K. (1964)[g]	0.40	
U. S. A. (1959)[e]	0.37	

X stands for concentration ratios derived from data on expenditures.

Sources : (a) [7]; (b) [27]; (c) [23]; (d) [4]; (e) [23]; (f) [13]; (g) [31].

TABLE III

PERCENTAGE OF POPULATION WITH INCOMES BELOW $80

Concentration Ratio (Country)	Average Income of Country				
	$100	$150	$200	$250	$300
0.60 (Iraq)	70.0	56.7	50.0	34.0	26.7
0.54 (Brazil)	70.0	51.6	26.4	20.6	16.7
0.50 (Costa Rica)	70.0	44.6	32.9	16.2	x
0.44 (Sri Lanka)	56.8	36.4	24.9	18.0	13.7
0.40 (Sudan)	54.1	35.2	22.6	14.2	x
0.33 (India)	50.0	23.3	10.0	x	x

x=less than 10 percent.

TABLE IV

AVERAGE SIZES OF HOUSEHOLDS BY EXPENDITURE CLASSES: INDIA 1967-68

Expenditure Classes	Average Size of Households	
	Urban	Rural
Poorest 5%	6.00	5.77
5 — 10%	6.18	5.97
10 — 20%	6.00	5.72
20 — 30%	5.82	5.57
30 — 40%	5.48	5.33
40 — 50%	5.37	5.31
50 — 60%	4.93	5.30
60 — 70%	4.39	5.33
70 — 80%	3.49	5.11
80 — 90%	2.89	4.75
90 — 95%	2.74	4.61
Richest 5%	2.25	3.78

Source : [5].

TABLE V

AVERAGE SIZE OF HOUSEHOLDS BY EXPENDITURE CLASSES : INDONESIA (EXCLUDING JAKARTA) 1964—65

Expenditure Classes (Monthly Expenditure Rupiahs 000)	Average Size of Households	
	Urban	Rural
Up to 5	5.14	5.10
5 — 10	5.89	4.95
10 — 15	5.65	4.76
15 — 20	5.44	4.69
20 — 25	5.37	4.54
25 — 30	5.05	4.51
30 — 35	5.01	4.38
35 — 40	5.26	4.32
40 and over	4.53	4.01

Source : [26].

TABLE VI

HOUSEHOLD SIZE AND PER CAPITA EXPENDITURE

Household Size	Per Capita Monthly Expenditures			
	Rural India (Rupees)		Indonesia (Rupiahs)	
			1964-65	
	1958-59	1964-65	Urban	Rural
1	31.8	38.3	9785	7948
2	26.5	31.4	10126	7099
3	23.4	28.0	8851	6131
4	21.4	26.3	7333	5575
5	20.5	25.3	7511	5055
6	19.4	24.3	6566	5140
7	20.1	23.7	6817	4953
8	19.3	23.7	6802	5313
9	20.8		6896	5733
10	20.9			
11	21.1			
12	23.7	25.7	8216	5452
13	21.1			
14	25.5			
15+	28.0			
Total	22.1	26.7	7470	5472

TABLE VII

CONCENTRATION RATIOS OF PER CAPITA MONTHLY EXPENDITURES BY HOUSEHOLD SIZE : INDONESIA (EXCLUDING JAKARTA) 1964-65

Household Size	Concentration Ratios of Per Capita Monthly Expenditures			
	Java-Madura		Other Islands	
	Urban	Rural	Urban	Rural
1	0.305	0.307	0.217	0.251
2	0.280	0.320	0.265	0.285
3	0.298	0.322	0.291	0.307
4	0.295	0.325	0.348	0.326
5	0.314	0.323	0.365	0.319
6	0.314	0.332	0.365	0.333
7	0.283	0.324	0.374	0.333
8	0.276	0.344	0.407	0.325
9	0.298	0.326	0.321	0.329
10	0.302	0.336	0.350	0.314
Total	0.304	0.329	0.364	0.334

TABLE VIII

DISPARITIES BETWEEN URBAN AND RURAL SECTORS

Country (Year)	Percent of Population in Urban Areas : 1960	Average Urban Income as % of Rural Income
India (1961-62)	14	176
Indonesia (1964-65) .. (excluding Jakarta)	12	137x
(Java-Madura, 1967) ..	16	133x
Pakistan (1963-64) ..	27	154
Philippines (1965) ..	17	251
Sri Lanka (1963) ..	17	189
Taiwan (1964)[a] ..	29	103
Thailand (1962) ..	9	304
Japan (1963)[a] ..	46	106
U. S. A. (1959) ..	68	150

Notes : x=expenditures ;
a =between non-farm and farm sectors respectively.

TABLE IX

INEQUALITIES WITHIN SECTORS

Country	Concentration Ratios	
	Urban	Rural
India (1961-62) ..	0.47	0.32
Indonesia (1964-65) ..	0.34	0.35 x
(excluding Jakarta) (Java-Madura, 1967) ..	0.31	0.26
Pakistan (1963-64) ..	0.45	0.36
Philippines (1965) ..	0.53	0.43
Sri Lanka (1952-53)[a]	0.52	0.45
Thailand (1962-63)[a] ..	0.45	0.44

Notes : x=expenditures ;
a =non-agricultural and agricultural sectors respectively.

TABLE X

RATIOS OF AVERAGE ANNUAL EARNINGS BY EDUCATIONAL LEVEL

Group of Countries	Primary/ None	Secondary/ Primary	Higher/ Secondary
USA, Canada, UK, Netherlands, France, Norway	N. A.	1.4	1.7
Israil, Greece, Mexico, Chile, Colombia	2.4	1.9	1.8
Malaysia, Philippines, Ghana, S. Korea, Kenya, Uganda, Nigeria, India	2.4	2.4	2.7

Source : [24, Table 8-4r].

TABLE XI

UNEMPLOYED AND UNDEREMPLOYED IN LIMA-CALLAO METROPOLITAN AREA, PERU, 1967 (AS PERCENTAGE OF ECONOMICALLY ACTIVE POPULATION)

Group	Percentage of Economically Active Population
1. Unemployed	4.2
2. Income above 1200 soles/month, works less than 35 hours/week, wants more work.	3.6
3. Income below 1200 soles/month, works more than 35 hours/week,	19.5
4. Income below 1200 soles/month, works less than 35 hours/week, wants more work.	2.5
Total Unemployed/Underemployed	29.8

Source : [29].

TABLE XII

GROWTH OF OUTPUT, EMPLOYMENT AND PRODUCTIVITY IN INDUSTRIAL PRODUCTION

1955-68 (PERCENTAGES)

Changes	Developed Market Economies	Less-developed Countries		
		Total	Latin America	Asia
1. Increase in Production	94	126	112	227
2. Increase in Employment	25	61	43	63
3. Increase in Productivity	55	40	48	100
4. Change in Structure of Output	5	7	3	37
5. Change in Productivity in Individual Sectors	47	32	43	46

Source : [30].

REFERENCES

1. Arthur Lewis, W., "Economic Problems of Development", in Council of World Tensions, *Restless Nations*, (London: Allen and Unwin, 1962).
2. ————————, *The Development Process,* (UN Centre for Economic and Social Information, 1970).
3. Bardhan, P.K., "On Minimum Level of Living and the Rural Poor", *Indian Economic Review*, Vol. V. New Series, April 1970.
4. Bergen, A., "Personal Income Distribution and Personal Savings in Pakistan 1963-64", *Pakistan Development Review*, Vol. VII. No. 2, Summer 1967.
5. Dandekar, V. M. and Rath, N., "Poverty in India", *Economic and Political Weekly*, January 1971.
6. de Wit, Y. B., "The Kabupaten Program", *Bulletin of Indonesian Economic Studies*, March 1973.
7. ECAFE Report "Distribution of Income and Wealth in India", (Bangkok, 1972, mimeo.).
8. *Education and National Development*, Report of the Education Commision of India 1964-66 (New Delhi: National Council of Educational Research and Training, 1970).
9. *Education for National Development*, Report of the Presidential Commission to Survey Philippine Education, (Manila, 1970).
10. Government of India, Planning Commission, *Fourth Five Year Plan,* (New Delhi, 1970).
11. International Labour Organisation, *Towards Full Employment—A Program for Colombia,* (Geneva, 1970).
12. ————————, *Matching Employment Opportunities and Expectations —A Program of Action for Ceylon*, (Geneva, 1971).
13. Kuznets, S., "Quantitative Aspects of the Economic Growth of Nations : VIII Distribution of Income by Size", *Economic Development and Cultural Change*, XI. No. 2, Part II, January 1963.
14. ————————, *Economic Growth and Structure,* (London: Heinemann, 1965).

15. ——————, *Modern Economic Growth, Rate, Structure and Spread*, (New Haven: Yale University Press, 1966).

16. ——————, "Economic Growth and Income Inequality", *American Economic Review*, March 1955.

17. Little, I. M. D., Scitovsky, T. and Scott, M., *Industry and Trade in Some Developing Countries*, (Paris, OECD, 1970).

18. Lydall, H., *The Structure of Earnings*, (Oxford : Clarendon Press, 1968).

19. McNamara, R. S., Address to the United Nations Conference on Trade and Development, (Washington : IBRD, 1972).

20. Minhas, B. S., "Rural Poverty, Land Redistribution and Development", *Indian Economic Review*, Vol. V. New Series, April 1970.

21. Myrdal, G., *Asian Drama*, (New York : Pantheon Press, 1968) Vol. K.

22. Ojha, P. D., "A Configuration of Indian Poverty : Inequality and Levels of Living", *Reserve Bank of India Bulletin*, January 1970.

23. Oshima, Harry T., "Income Inequality and Economic Growth—The Postwar Experience of Asian Countries", *Malayan Economic Review*, October 1971.

24. Psacharapoulos, G., *Returns to Education*, (Elseveier, 1973).

25. Robinson, R. and Johnston, P., *Prospects for Employment Opportunities in the Nineteen Seventies*, (London : HMSO, 1971).

26. Socio Economic Survey of Indonesia, 1964-65.

27. Socio Economic Surveys of Indonesia.

28. Sundrum, R. M., "Consumer Expenditure Patterns", *Bulletin of Indonesian Economic Studies*, Vol. IX. No. 1, March 1973, pp. 93-94.

29. Turnham, D. and Jaeger, I., *The Employment Problem in Less Developed Countries*, (Paris : OECD, 1971).

30. United Nations, *Growth of World Industry*, 1969 edition (New York, 1971).

31. ——————, *Incomes in Post-War Europe*, (New York, 1967).

32. ——————, *World Economic Survey* 1969-70, (New York, 1971).

33. Vaidyanathan, A., *Some Aspects of Inequalities in Living Standards in Rural India*, (New Delhi : Planning Commission, 1970, mimeo.).

Farm Size and Productivity in Bangladesh Agriculture : A Case Study of Phulpur Farms

by

MAHABUB HOSSAIN*

I. INTRODUCTION

Poverty and underdevelopment in Bangladesh are closely related to a very low level of productivity in agriculture which absorbs more than 75 percent of the total labour force and contributes 55 percent to the gross domestic product of the economy. During 1965-66, for example, in the production of rice which employs roughly 80 percent of the total cultivable land, yield per acre was less than 25 percent of that of Australia, about 30 percent of that of Japan and also significantly lower than most of the neighbouring rice growing countries which have similar geographical and human circumstances[9]. Even after 1965 when the yield of foodgrains was increased substantially by the 'Green Revolution' in all of the neighbouring countries, the increase in yield of rice in Bangladesh has been negligible. The low level of productivity in this single major foodcrop coupled with a very high density of population[1] has compelled the economy to devote most of its land resources to production of this subsistence crop and only a small amount of land is left over for the production of raw material and export crops.

In order to prescribe policies for growth in agriculture one should know the factors responsible for such low levels of productivity. So far blame has been placed mostly on the use of the age-old backward technology. But one should also know what role the existing size-structure of farms plays in yielding this low level of productivity. If productivity differs significantly among different size groups of farms, the existence of a particular size structure of farms can add

---

*Mr. Mahabub Hossain is a staff economist at the Bangladesh Institute of Development Economics and is currently a graduate student at the Cambridge University, England. He is grateful to Dr. C. O' Longhlin for her supervision and guidance throughout this study. Assistance provided by A. H. Mondal, Assistant Staff Economist at the Institute in tabulating data from the original questionnaire is gratefully acknowledged. This study has been financed by a fellowship from United Nations Development Programme.

[1] Bangladesh had a population density of 1306 in 1970-71 which is the highest in the world excluding a few islands like Hong Kong.

to the explanation of the present low levels of productivity. A study of productivity by farm size can also help policy makers to assess probable effects on agricultural productivity and economic growth of any kind of land reform that can directly or indrectly affect the size distribution of farms. For example, the major argument against fixing a maximum ceiling on land holding and the distribution of expropriated lands among small-holders and landless peasants has been that such policy by eliminating more productive large holdings leads to a reduction in farm efficiency and agricultural productivity. It is necessary to know how valid such conclusions are in the case of agriculture in Bangladesh.

One can measure as many productivity indices as there are factors of production but since land is the most scarce factor of production in Bangladesh we shall mainly be concerned here with the productivity of land, and the reasons of its variation among different size groups of farms. We shall also try to derive indices of total productivity by size groups by taking into account the marginal contribution of traditional factors, land and labour, and the growth augmenting modern factors—fertilizer and irrigation.

In Section II the nature of data on which this study is based is explained and the variables which are mostly used in the text are defined. In Section III some characteristics of the sample farms are presented and are compared with those of Bangladesh as a whole to show how representative are the samples. Section IV presents the indices of the productivity of land by different size group of farms and explains some of the reasons for its variation. In Section V the total productivity indices are measured for different groups of farms from the separate contribution of different factors of production. The implications of the results for theory and policy are briefly discussed in Section VI which is followed by summary and conclusion.

II. NATURE OF DATA AND DEFINITIONS

1. The Data

The data are taken from the 'Survey of Farms in East Pakistan' conducted by the Pakistan (Now Bangladesh) Institute of Development Economics during 1969-70. The survey was done in three areas of Bangladesh which have access to irrigation water, i.e., 'Phulpur' in Mymensingh district, 'Thakurgaon' in Dinajpur district and 'Dacca-Narayanganj' in Dacca district.

Something should be said about the sampling technique and the procedure of collecting data. Two unions[2] in each area were selected purposely,

---

[2] A Union is the lowest administrative unit in Bangladesh and consists of a number of villages.

consideration being given to the accessibility of the area to the investigators and then 200 farms were randomly selected from these two unions—70 percent of them from the irrigated villages[3] and 30 percent from the non-irrigated villages. The investigators, all of whom were graduates, were asked to fill up four questionnaires one relating to the general characteristics of the farms and the others regarding the output and inputs in the production of all crops and marketing and credit during the three crop seasons in the country. The investigators stayed in the area during October 1969 to June 1970 and collected information interviewing farmers several times in each month. However, it has to be qualified that the data may not be exactly accurate as they are based on farmers' reporting rather than actual observations in the field, but the investigators tried to attain maximum level of accuracy by checking the internal consistency of different answers to the questions.

For this study only the irrigated farms in 'Phulpur' are selected to form a relatively homogeneous group. Since we are interested in productivity of land according to size during a year, we have excluded those farms which changed their size during the year by taking lands from or by giving lands to others. In doing so we are left with 95 farms which we have divided into four groups according to the size of the cultivating units, i. e., zero to less than 2.5 acres, 2.5 to less than 5.0 acres, 5.0 to less than 7.5 acres and 7.5 acres and over. The farms in each size are then grouped together to represent one class. There are 3 farms of more than 12.5 acres size. But since any inference drawn on the basis of only three farms may be unrepresentative of the group due to the possibility of having high sampling error, they have been merged together with the previous group. However, recognising the fact that the average size of holding in Bangladesh is 2.59 acres[9] and only 2.60 percent of farms have land holding over 12.5 acres size[5], the last group in our study represent fairly large farms in the context of Bangladesh.

2. Measurement of Variables

Size of farms. The usual definition of the size of farm is the land owned plus the land rented-in minus the land rented-out. But since we are interested in the productivity in crop production we have measured farm size by the net amount of land under crop cultivation in acres.

---

[3] An irrigated village is one where some form of controlled irrigation facilities are available (for example, one or more low lift power pumps or deep tubewells).

Output. Output is measured as the gross value of production, i. e., production in physical unit multiplied by the harvest price of the crop at the village in 1969-70. The 'gross output' concept rather than the 'value added' concept has been used because of the difficulty of imputing values to the 'farm-supplied' inputs and because we like to measure the contribution of the modern inputs like chemical fertilizers to output.

Labour. Labour is measured in man-days of work done by both the family and the hired permanent and casual workers. The man-days are standardised by eight hours of work in a day but no adjustment could be made for the quality differences.

Capital. There has been little use of capital in the farms in its true sense. No mechanical equipment was used in the area for cultivation like tractors, power tillers, pumping machines etc. Irrigation is provided by the low-lift power pumps but these are owned by the government and the farmers pay water charges for the use of water. The only capital owned were bullocks and ploughs but it is very difficult to measure the value of the stock and the measurement of the actual flow of this type of capital for production is almost impossible.

Instead, we have used here a totally different concept, 'the expenditure on chemical fertilizer and irrigation water'. These are the two major inputs that have to be purchased from the market. They are valued at prices that farmers paid which were less than the cost due to government subsidy. We have used the costs to the farmer rather than the costs to the society because it is the former that influences farmer's decision about how much of these inputs he will use.

Gross Cultivated Land. This is measured as the sum total of land used under different crops during the year and thus each piece of land has been counted twice if it is used twice during the year.

Net Cultivated Land. This is the amount of land cultivated during the year and excludes the number of uses of a particular piece of land. This is exactly the same in our case as the 'size of farm'.

III. CHARACTERISTICS OF THE SAMPLE FARMERS

Distribution of Holdings and Area Cultivated. Table I below shows the distribution of the farms according to their size in 1969-70 along with the distribution of area. The same information for Bangladesh as a whole is also presented in the table for comparison.

TABLE I

DISTRIBUTION OF FARMS ACCORDING TO SIZE AND CULTIVATION AREA

	Sample			Bangladesh	
Size Group (in acres)	No. of Farms	Percentage of Farms	Percentage of Land Cultivated	Percentage of Farms	Percentage of Land Cultivated
0—2.49	26	27	10	57	21
2.5—4.99	38	40	30	26	30
5.0—7.49	16	17	21	9	18
7.5—12.49	12	13	26	5	16
12.5 & over	3	3	13	3	15

Source for Bangladesh data : [5].

The table indicates a greater concentration of farms in the lower size groups and a highly skewed distribution of area cultivated. In the sample area, only 10 percent of the land is cultivated by 27 percent of the farms, whereas 13 percent of the land is cultivated by only 3 percent of the farms. The ownership distribution of farms is more unequal than the size distribution. Referring to Table B-1 in the Appendix we note that at the bottom 40 percent of the farms own only 12 percent of the total land, whereas the top 16 percent of the farms own 45 percent of the total land. However, compared to the country as a whole, the distribution of holdings and area cultivated seems to be less unequal in the area under study.

System of Land Tenure. There is no pure tenant farm among the farms studied. But quite a large number of farms are owner-cum-tenant operated. The main system of tenancy in the area is 'share cropping'. Usually the small owners, having sizeable farm capital (bullocks etc.) and surplus family labour rent land from the large owners and get 50 percent of the gross produce. But it is not always the case that small owners rent in and large owners rent out. Small owners also rent out land due to the uneconomic distance of the plot from the farm and other difficulties of cultivation.

Table II presents information about the average size of land owned and the average size of land cultivated by farm size. The average size of land cultivated is higher than the average size of land owned indicating a net incoming of land from the outside farms. The net inflow is greater than the difference between the cultivating size and land onwed, because a portion of the land owned is used for the homestead and other purposes.

TABLE II

AVERAGE SIZE OF LAND OWNED AND CULTIVATED

Size Group (in acres)	Average Size of Land Owned	Average Size of Land Cultivated	Land Cultivated as a Percentage of Land Owned
0—2.49	1.37	1.72	126
2.5—4.99	2.82	3.50	128
5.0—7.49	5.58	5.86	105
7.5 & over	11.51	11.02	96
All Farms	4.26	4.60	108

As indicated by the table, there has been a positive net renting in of land in all but the top size group and the smaller farms in general have rented in more lands than the larger farms. Another thing to note from the table is that the average size of the farms studied is less than five acres. This means that more than two thirds of the farms are below the average size (Table I).

Size of Family, Size of Family Labour and Educational Status. Table III shows that the average size of family[4] of the farms studied is 7.58 persons. This is higher than the average rural family size of Bangladesh as a whole which is 5.65 [9] .There is a positive correlation between the size of farms and the average size of family but cultivated land per member is higher in the larger farms than that in the smaller ones.

Amount of family labour is closely related to the number of adult males as the females in the area do not work in the farm due to muslim tradition. However,

---

[4] The 'size of family' is defined as the number of persons a farm supports. The positive correleation between the farm size and family size can be explained by the fact that the larger the size of holding the greater is the number of distant relatives a farmer supports in exchange for farm and household work and/or that a joint family together own larger amount of land than a single family.

not all the adult males work in the farm specially in the ones which own relatively large amount of land. They are a part of the village gentry and the members consider it disgraceful to work in the field. Again those members who go to school or have high school level education do not work in the field and their number is greater in the larger farms. With these exceptions, the average adult male unit constitute the potential family labour force of the farms.

TABLE III

SIZE OF FAMILY, ADULT MALE UNIT AND LITERACY RATIO BY FARM SIZE

Size of Farms (in acres)	Average Family Size	Average Number of Adult Males	Land per Member (in acres)	Land per Adult Male (in acres)	Literacy Ratio
0—2.49	5.50	1.38	0.31	1.25	22
2.5—4.99	7.18	2.05	0.49	1.71	20
5.0—7.49	8.62	2.76	0.68	2.12	33
7.5 & over	11.07	3.73	1.00	2.95	39
All Farms	7.58	2.24	0.61	2.05	27

The table shows the average number of adult males[5] is higher the larger the farm. But still the amount of land available for cultivation per adult male is higher for the larger farms indicating that the larger farms are more endowed with land than labour.

The literacy ratio[6] for the farms studied is higher than that of the country as a whole. Again larger farms have more literate members than that of the smaller farms.

Cropping Pattern. The cropping pattern is roughly similar in the sample farms as in the country as a whole except that they produce more *boro* variety of rice than the *aus* variety. This is mainly because they have access to irrigation water and the *boro* variety requires much more irrigation than the *aus* variety.

---

[5] Adult male is defined as the number of males over 12 years of age.

[6] Literacy ratio is the percentage of members able to read and write.

TABLE IV

CROPPING PATTERN IN SAMPLE FARMS

Crops	Percentage of Land Allocated	
	In Sample Farms (1969-70)	In Bangladesh as a Whole (Average for 1966-67 to 1968-69)
Rice	87.2	78.2
Aus (Autumn harvested)	14.2	25.2
Boro (Summer harvested)	27.5	5.5
Aman (Winter harvested)	45.5	47.6
Jute	7.6	7.7
Other Crops	5.2	14.3

Source for Bangladesh data : [6].

IV. FARM SIZE AND PRODUCTIVITY OF LAND

Productivity is usually measured as the ratio of output to associated inputs. When productivity is measured in relation to a particular input it is called partial productivity, but when it is measured in relation to all the inputs taken together, it is called total productivity[7]. In the case of agriculture in Bangladesh, the major primary inputs are land and labour. But since land is relatively scarce, it is the productivity of land which is usually used as a measure of the efficiency of agriculture in the land scarce countries. In Bangladesh, the possibility of expanding area under cultivation is limited, so greater output must be achieved by increasing other factors including the modern inputs per unit of land. For this reason we shall be mainly concerned here with the productivity of land by farm size although we shall also present the indices of labour productivity to see how it varies among different size group of farms.

There can be two measures of land productivity according to two definitions of land used, i. e., output per unit of gross cultivated land and output per unit of net cultivated land. We shall henceforth call output per unit of net cultivated land as 'land productivity' and output per unit of gross cultivated land as 'output per acre'.

---

[7] A survey of different concepts of productivity and their measurement in empirical research is given by Nadiri in [14, 15].

Land productivity has been measured from the disaggregated farm data as follows :

$$P_L = \frac{\sum_j \sum_i q_{ij}}{\sum_j L_j} \qquad (1)$$

where, P_L=land productivity in a particular size group,

q_{ij}=output of the ith crop grown by the jth farmer of that group,

L_j=the size of the cultivated land in acre of the jth farmer of that group.

'Output per acre' on the other hand, has been measured as follows :

$$Q/L = \frac{\sum_j \sum_i q_{ij}}{\sum_j \sum_i L_{ij}} \qquad (2)$$

where, Q/L='output per acre' in a particular size group.

L_{ij} =acres of land used for cultivating the ith crop by the jth farmer.

'Output per acre' is one of the two components of land productivity. For

$$\frac{\sum_j \sum_i q_{ij}}{\sum_j L_j} = \frac{\sum_j \sum_i q_{ij}}{\sum_j \sum_i L_{ij}} \times \frac{\sum_j \sum_i L_{ij}}{\sum_j L_j} \qquad (3)$$

The first term on the right hand side of the above expression is 'output per acre' and the second term is cropping intensity defined as total cropped land as a ratio of net cultivated land.

Table V presents indices of land productivity, 'output per acre' and cropping intensity by farm size in the farms studied. Productivity of land is more or less the same up to 5 acres but then it decreases sharply with the increase in size. The result is quite contrary to the traditional notion that larger farms are usually more productive as they can reap economies of scale and they are more progressive in innovation but similar results have also been obtained in other farm management studies in the Indian subcontinent. The table also indicates that cropping intensity and 'output per acre' are also inversely related to farm size. Thus less intensive cultivation of land in larger farms and low 'output per acre' are both responsible for the low productivity of land. So, whatever concept of productivity is used, larger farms in the area are less efficient in the use of land than the smaller farms.

TABLE V

PRODUCTIVITY OF LAND AND LABOUR BY FARM SIZE

Size Group (in acre)	Productivity of Land (in taka)*	'Output per acre' (in taka)	Cropping Intensity (in percentage)	Productivity of Labour (in taka/man-day)
0—2.49	552	372	149	7.61
2.5—4.99	560	375	149	8.13
5.0—7.49	463	336	138	7.62
7.5 & over	326	258	126	6.49
All Farms	449	316	142	7.38

*Taka is the currency of Bangladesh and was equivalent to roughly 21 US cents in 1969-70.

The table also gives labour productivity by farm size which has been computed from data as follows :

$$P_N = \frac{\sum_j \sum_i q_{ij}}{\sum_j \sum_i N_{ij}} \qquad (4)$$

where, P_N=labour productivity in a particular size group,

N_{ij}=man-days employed by the jth farmer in the production of ith crop.

With the exception of very small farms, labour productivity is also inversely related to farm size. This indicates that larger farms are also less efficient in the use of labour than smaller farms.

The inverse relationship between farm size and land productivity that is indicated by Table V is achieved through the aggregation of the individual farm data and may not be true statistically. In order to examine the statistical relationship between these two variables we have estimated the following two relations from the disaggregated farm data of all the 95 farms.

$$Y_1 = a_1 + b_1 X + U_1 \qquad (5)$$

$$Y_2 = a_2 + b_2 X + U_2 \qquad (6)$$

where, Y_1=productivity of land in a farm (in taka),

Y_2='output per acre' in a farm (in taka),

X=the size of that farm,

U's are the stochastic disturbance terms.

The relations estimated by the ordinary least square method gave the following results.

$$Y_1 = 570 - \underset{(5.7)}{15.43} X \qquad R_2 = .0737$$

$$Y_2 = 383 - \underset{(3.1)}{7.52} X \qquad R_2 = .0595$$

The sign of the coefficient of farm size is negative in both the relations indicating the inverse relationship between farm size and productivity of land and also 'output per acre'. Further the value of the coefficient is significantly different from zero at one percent level as indicated by the value of the standard error given in parentheses below the coefficient.

Some Explanations for the Observed Relationship

The inverse relationship between farm size and productivity of land was also observed in different states of India by the Indian Farm Management Studies during the late fifties. A Survey of the different theoretical interpretations of this phenomenon by the Indian economists is given by Bhagawati and Chakrabarti in [1].

Sen [21, 22] offered a general explanation for higher productivity in smaller farms in terms of low opportunity cost of labour in family farms in labour surplus economies. His argument is that smaller farms are based mainly on family labour which is abundant relative to the size of the farm and since such labour has little alternative job opportunities outside the farm, the tendency is to employ it on the farm up to the maximum as long as the marginal productivity of labour is positive. The bigger farms, on the other hand, depend more on hired labour and so they would restrict their employment to the level at which marginal yield is the same as the market wage rate. Employment per acre is then higher in the smaller farm than in the larger farm and while marginal productivity of labour is less in the former, 'output per acre' will be higher so long as the marginal productivity is positive.

Mazumdar [12, 13] also observes that higher productivity of land in smaller farms is a function of the higher application of labour input per acre—the other inputs varying in the same proportion as labour. But application of more inputs, according to him, is due to higher intensity of cultivation in smaller farms because of the necessity to earn a minimum level of living for maintaining the biological needs of subsistence. Larger inputs on smaller farms are thus expanded not on one crop alone but on more than one crop grown during the whole year on the same piece of land. This may, thus, explain higher productivity in smaller farms when productivity is defined in terms of area under cultivation but 'output per acre' may still be higher in the larger farms. Rudra [18] argues that it is output per acre which should be used as a measure of efficiency rather than productivity of cultivated land because it is not the land that is the input, but the service or the use of land, a proper measure of which must count twice every piece of land that is used twice and leave out such portion of land that is not used at all.

Khusro's [10] explanation is based on the relationship between tenancy and farm-size. He observes that as farm size expands, the land taken on lease and cultivated on the basis of tenancy increases as a percentage of total land. And there is a general presumption that inputs applied on own land are higher and better than on leased-in land. If this presumption is correct, this fact too might bring about a decline in returns per acre on larger farms.

Many of these a-priori-arguments seem not to be valid in the case of the farms in our study. As already noted in Section III land rented-in per acre of owned land is higher in the smaller than in the larger farms contrary to the argument of Khusro. Thus although it is not possible to say anything about the productivity differences in the rented and owned land, it is not true that higher productivity in smaller farms is due to smaller proportion of leased-in land in them. We have also noted that although cropping intensity is higher in the smaller farms as argued by Mazumdar, but 'output per acre' was still higher in them.

Coming to the application of major inputs per acre of land we see that labour used per acre of gross cultivated land is negatively related with size. The ratio of irrigated land to the total land cultivated is also higher in smaller farms. Only in the case of fertilizer, application per unit of land increases with the increase in farm size up to 7.5 acres, after then it declines. Thus higher 'output per acre' in small farms is to some extent due to the higher application of inputs.

TABLE VI

USE OF MAJOR INPUTS PER ACRE OF LAND

Size Group (in acres)	Labour (in man-days)	Chemical Fertilizer		Irrigation Ratio (as a % of gross land)
		Per Acre of Treated Land (in seers)	Per Acre of Land Cultivated (in seers)	
0—2.49	48.88	66.88	22.17	33.2
2.5—4.99	46.21	77.82	24.73	31.8
5.0—7.49	44.11	103.21	32.98	25.6
7.5 & over	40.27	33.36	5.34	16.9

But it is not clear whether the higher application of labour per unit of land is due to the low opportunity cost of labour in family farms for we have already noted that the average productivity of labour is also higher for the smaller farms although they apply relatively more labourers per unit of land. There are factors that can explain both the higher application of labour and higher productivity of labour in the smaller farms.

In order to go deeper into the problem we should have to look into the productivity in different crops as well as the allocation of land by different size group of farms among these crops which are given in Table VII. The table indicates that the larger farms have devoted proportionately less land to the more productive crops than the smaller farms. Among different varieties of rice to which almost 87 percent of the total land is devoted, the larger farms have put relatively more land to the low yielding varieties like *aus* and broadcast *aman* and less to the traditional high yielding varieties like transplanted *aman* and *boro*, than the smaller farms. In the case of the improved *boro* variety (Irri-8), the medium farms have devoted relatively more lands than both small and large farms. Since cultivation of this variety requires much larger investment than traditional varieties in water and chemical fertilizers, the small farms could not perhaps afford to put more land under this variety but the reason why the large farms did not grow more of this variety can not be explained by this factor. They may have other constraints.

TABLE VII

ALLOCATION OF LAND AMONG DIFFERENT CROPS BY SIZE (IN PERCENTAGE)

Farm Size (in acres)	Rice					Jute	Oil Seeds	Pulses
	Aus (Broad-cast)	Aman (Trans-planted)	Aman (Broad-cast)	Boro (Tradi-tional trans-planted)	Boro (Imp-roved)			
0—2.49	10.4	35.9	5.4	29.3	3.9	8.8	4.2	2.2
2.5—4.99	8.1	34.7	12.9	22.9	8.9	8.8	3.0	0.5
5.0—7.49	17.9	29.0	17.9	15.7	9.9	5.9	2.8	1.0
7.5 & over	20.3	26.8	21.6	14.3	1.7	8.0	4.3	3.0
Output/acre All Farms	189.0	318.0	121.0	429.0	852.0	303.0	80.0	83.0

Why do the large farms devote relatively less land to the more productive crop varieties? One factor that can explain this kind of land allocation is the relative difference in the situations of the plots of land. The larger farms may have relatively less low-lying lands and since *aman* and *boro* paddy can only be grown in the low lying lands which can hold standing water for most of the time in the growing cycle, larger farms can not put more land under these crops than permitted by this factor. But since we are dealing with only one area and the number of farms in each group is sufficiently large, it is doubtful that this factor would favour smaller farms than the larger ones.

Another explanation may be given in terms of differences in labour intensity in different crops. Since mechanised cultivation is completely absent in the area, the range of substitution between land and labour is very small in a crop once it is sown. A farmer can not employ less labour than required for harvesting his field, for clearing weeds and for similar kind of operations. If he tries to do so it will drastically reduce the yield. One can reduce labour use per unit of land only in the case of land preparation where a farmer can plough the land, say, three times before sowing when five times is normally required. Even in this case yield will be reduced to some extent. So in the face of labour shortage a farmer can only economise the use of labour by allocating relatively more land among the less labour intensive crops. And if it happens that less labour intensive crops are also less productive and there is a labour shortage relative to land, it is quite rational on the part of large farms to devote more land to the less productive crops.

Closely related with this is the difference in the seasonal pattern of demand for labour in different crops. It is the peak periods of agricultural operations when farmers face shortage of labour and even small farms tend to hire labour at these times. So it is rational on the part of a farm which has more land relative to family labour, to put relatively less proportion of land to a crop which is less labour intensive but requires large application of labour in a few periods of short duration than a crop which is more labour intensive but in which agricultural operations are evenly spread throughout the growing cycle.

One may not, however, be convinced about the theory of labour shortage in a country like Bangladesh where labour is abundant relative to land. If one looks to the sowing and harvesting periods of different crops it becomes clear that there may be certain times in a year when all labour is employed even though people may remain idle at other times. Table VIII which gives the sowing and harvesting periods of different crops, indicates peak agricultural operations within a few short periods of time. Since harvesting and transplanting are the two major agricultural operations, it can be seen from the table that November and December is the peak period of agricultural operations in the area when the farmers have to harvest the two varieties of *aman* paddy and prepare land and transplant the *boro* paddy and since these crops consume about three-fourths of the total cultivated land in the area, the magnitude of labour demand during this period can well be imagined. The two other peak periods of agricultural operations are July-August and March-April. Since larger farms draw quite a large part of their labour from the smaller farms it may be very difficult for them to acquire as much labour as required during these peak periods as the smaller farms would not be willing to rent their labour until they have performed these operations in their own fields. The large farms can thus minimise the risk by allocating land under different crops in such a way that the labour requirement from outside family during these periods does not exceed the amount that they think they will be able to draw from outside sources. Thus they allocate relatively more land to broadcast *aman* paddy in which yield is low and requires much less labour for harvesting per acre than the transplanted *aman* paddy and when they practise double cropping they do so by growing pulses and oilseeds in *aus* and jute lands rather than cultivating *boro* paddy in the *aman* land as it is highly labour intensive.

TABLE VIII

SOWING AND HARVESTING PERIODS OF DIFFERENT CROPS

Crops	Sowing Period	Harvesting Period
Aus (Broadcast)	Mid-March to April	July
Aman (Broadcast)	April to May	November to December
Aman (Transplanted)	July to August	November to December
Boro (Traditional)	December	Mid-March to April
Boro (Improved)	January	June
Jute	March to April	July to August

To indicate the shortage of labour during peak seasons we have made a rough estimate of the percentage of family labour that would have been required during November and December if no labour had been hired, from the operation wise labour-use data in different crops. The following assumptions are made (i) male adults in every group of farm, except those who go to school, work in the fields, (ii) one adult male can spend 24 labour days during a month and (iii) operations are evenly distributed during these two months, that is, there are no slack periods during this overall peak period. The estimates along with the family labour requirements during the whole year and the percentage of labour actually hired[8] are presented in Table IX.

---

[8] The figure for the small farms contain an upward bias. These are estimated by grouping of individual farm data and so all intra-group hirings which are more common among the small farms, are included. However, large and medium farms, specially above 5-acre size, do not rent labour outside the farm.

TABLE IX

LABOUR REQUIREMENTS DURING NOVEMBER AND DECEMBER BY FARM SIZE

Farm Size	Estimated (% of Available Family Labour)		Actual (% of Labour Used)	
	Family labour requirements during Nov.—Dec.	Family labour requirements during the whole year.	Labour hired during Nov.—Dec.	Labour hired during the year
0—2.49	68	33	39	38
2.5—4.99	89	42	44	37
5.0—7.49	93	53	54	58
7.5 & over	90	61	58	54

The table indicates that the farm operations during this period requires almost 90 percent of their available family labour for farms over 2.5 acre size—and they are over 40 percent higher than the family labour requirements over the whole year. The table also seems to indicate that larger farms have tried to minimise labour requirments during this peak period by the land allocation decision—the difference between the labour requirement during November-December and that during the whole year decreases with the increase in size. The table also suggests that it is hard to get more labour from outside the family during the peak periods than in the off periods as indicated by the difference in hired labour between whole year and the peak period.

The extent of labour shortage can be more clear if we consider the following facts. First, family adult males may have other work to do besides working in the fields, for example, they have to look after the draft animals, they have to do maintenance work in the houses etc. Second, not all the family adult males work in the fields specially in those families with relatively large holdings of land. By their wealth they are regarded as respectable families in the village and they feel farm work disgraceful for their status. Further, since well-to-do farmers have more capital, some of their members are engaged in other occupations which gives more returns than farm work, for example, working as middlemen or traders and businessmen. Third, the farm operations are very unlikely to be evenly distributed even during the peak period as we note the very small farms also hire labour during this period.

Large farms are then quite likely to face shortage of labour during peak periods of agricultural operations when labour is most required. To see whether this factor can explain the low productivity of land and labour in large farms, let us examine the relationship between productivity and labour intensity on the one hand and productivity and seasonality of labour demand on the other in different crops grown in the area. Information on land and labour productivity, labour intensity and seasonality in labour demand are presented in Table X.

TABLE X

PRODUCTIVITY AND LABOUR USE BY CROPS

Crops	Output per Acre (in taka)	Output per Man-day Employed (in taka)	Labour Used per Acre of of Land (man-days)	Hired Labour as a Percentage of Total Labour
Aus	189	4.60	42	45
Aman (Broadcast)	121	4.84	25	31
Aman (Transplanted)	318	8.37	38	54
Boro (Traditional)	429	9.70	44	49
Boro (Improved)	852	13.18	65	59
Jute	303	3.42	89	57
Oilseeds	80	3.82	21	27
Pulses	83	4.78	17	16

As can be seen from the table except jute and *aus* paddy, the more productive crops are also more labour intensive. For the eight crops studied the rank correlation coefficient between these two variables comes to .79—indicating a high positive relationship between them. Referring to Table B-3 in the appendix we see that there is no systematic variation in labour use by farm size in different crops. So less application of labour in larger farms in all crops taken together is due to the allocation of relatively more land to the less labour intensive crops and since these crops are also less productive in land it has resulted in low productivity of land in the larger farms.

Seasonality in demand for labour can roughly be measured by the ratio of hired labour to total labour because farmers hire labour from outside farms when labour required in an operation exceeds the available family labour. Table X also shows that crops which require higher percentage of hired labour are also more productive. The rank correlation coefficient between the land productivity and seasonality of labour demand for these eight crops is .88 indicating strong positive correlation between them. This also suggests that if large farmers allocate less land to these crops, this will also reduce overall land productivity in them.

Finally, there is also a positive correlation between land productivity and labour productivity in different crops. The rank correlation between land productivity and labour productivity is .69. This indicates that to the extent the larger farms put relatively less amount of land to the more land productive crops than the smaller farms, it would also reduce labour productivity in larger farms.

V. FARM SIZE AND TOTAL FACTOR PRODUCTIVITY

In the previous section we estimated productivity of land by farm size and tried to give some explanations for the inverse relationship between farm size and productivity. We also noted that the higher productivity of land in smaller farms was associated with the higher application of other factors per unit of land. And it can be argued that while from the point of view of the society, land is the most scarce factor and land productivity should be miximised, it may not be so in the case of large farms who have abundant land relative to other factors of production. So in order to decide which size group is the most efficient in using the available reasources one should look at the index of total factor productivity rather than productivity of a particular factor.

The total factor productivity in any size group of farms can be estimated as follows :

$$A_i = \frac{Q_t}{\sum_j a_j X_{ij}} \qquad (7)$$

where, A_i=total factor productivity in the ith size group,

X_{ij}=the amount of jth resource used in ith group and

a_j=the appropriate weight used for the jth resource.

The major problem that is faced in estimating the total factor productivity is the choice of the appropriate weight for different factors used. In productivity studies different authors have used different weights. Kendrick's [8] measure of total productivity, for expample, uses price of the factors as weight on the assumption that factors are paid their marginal productivities. We like to use here marginal productivities of the factors as weights because in countries like Bangladesh prices are not paid according to marginal productivities rather prices, fixed institutionally, determine the use of the inputs and hence their marginal productivities.

It is difficult to calculate accurately marginal productivity of different inputs from the production function in agriculture specially with cross-sectional data. This is because many of the inputs used in agriculture are highly complementary rather than substitutes, so in estimating production functions one has to suffer from the problem of multicollinearity which makes it difficult to estimate accurately separate contribution of each input to production. For example, there is high complementarity between the use of land and labour in the absence of mechanised cultivation, so one cannot use both land and labour as independent variables at the same time. Similarly there is a high correlation between the use of human labour and bullock labour because bullocks are only used with human labour. There is also a high positive relationship between the application of fertilizer and water, because fertilizer without water does not increase yield and in many cases it may damage the crops.

In order to avoid these problems we have estimated our production function in the following forms :

$$Q/_L = A\left(N/_L\right)^{B_1}\left(C/_L\right)^{B_2} U \qquad (8)$$

where, Q=output ;

L=land used in acres;

N=number of man-days employed;

C=total expenditure on fertilizer and water in taka and

U=stochastic disturbance term.

Under the assumption of constant returns to sacle[9], function (8) is the re-arrangement of the Cobb-Douglas production function.

$$Q=A\ N^{B_1}\ C^{B_2}\ L^{B_3} \qquad (9)$$

The production elasticities B_1 and B_2 are the same as in function (8) and B_3 can be estimated as $1-B_1-B_2$.

---

[9] The constancy of returns to scale have been verified empirically in Indian agriculture which is similar to that of Bangladesh [18,19].

Form (8) has been chosen to avoid inclusion of both N and L as explanatory variables. Bullock labour has been excluded in the hope its effect would be taken care of by N, and fertilizer and irrigation have been marged together to avoid the problem arising from their complementarities.

The estimated parameters along with other relevant statistics are given in appendix Table A-1. Here we present the marginal productivities of the inputs derived from them at the arithmetic mean level.

TABLE XI

MARGINAL PRODUCTIVITY OF DIFFERENT FACTORS OF PRODUCTION

(in taka)

Size Group (in acres)	Land (L) (per acre)	Labour (N) (per man-days)	Capital (C) (per taka)
0—2.49	41.02	5.12	3.31
2.5—4.99	85.01	3.93	5.31
5.0—7.49	45.96	5.60	2.21
7.5 & over	62.87	3.88	3.27
All Farms	58.46	4.59	3.81

For "All Farms" an increase in one acre of land, *ceteris-paribus*, would increase output by 58.46 taka, and extra man-day of labour employed would increase output by 4.59 taka and one taka invested on the margin on fertilizer and irrigation would give returns of 3.81 taka. The other figures have similar meaning. The total factor productivity was then calculated as follows :

$$A_i = \frac{L_i \ MPL_i + N_i \ MPN_i + C_i \ MPC_i}{L_i \ MPL + N_i \ MPN + C_i \ MPC} \qquad (10)$$

Where MPL, MPN and MPC are marginal productivity of land, labour and capital respectively in "All Farms". Those with subscript i denote the relevant variables in the ith size group of farms. The numerator of the ratio is equal to total output in the ith group of farms (sum of the input quantities multiplied by their respective marginal productivities) and the denominator indicates the amount of output that could have been produced by the ith group if the marginal products of the inputs were the same as in "All Farms". Hence if in combination the marginal products of ith group's inputs were higher than those of all farms, the ratio would have a value greater than one, the amount of excess indicating the portion by which ith group's productivity exceeds that of "All Farms".

TABLE XII

TOTAL FACTOR PRODUCTIVITY BY SIZE

Size Group (in acres)	Total Factor Productivity Index (All Farms=100)
0—2.49	99
2.5—4.99	108
5.0—7.49	105
7.5 & over	82

Total factor productivity is higher for the smaller farms with the exception of the very small size group. Thus small farms are more efficient not only in the use of land but also in the use of all other resources. The low level of efficiency of the very small farms is perhaps due to the dis-economies arising out of their smallness.

VI. SOME IMPLICATIONS OF THE RESULTS FOR THEORY AND POLICY

A. The Theory of Surplus Labour

Many development economists assume that there is a reserve army of surplus labour in agriculture and development possibility lies in productively employing these surplus labour in the manufacturing sector [11, 16]. Lewis goes as far as to assume that the marginal productivity of labour in argiculture is zero and that labour can be drawn from the agricultural sector to the manufacturing sector without reducing agricultural output. Our study of Bangladesh agriculture on the other hand shows that although there is a large amount of surplus labour duirng the slack agricultural season, there is a shortage of labour during the peak period, so it is not possible to draw labour from villages to towns permanently without reducing agricultual output. It is indeed the shortage of labour that seems to have induced the large farmers to cultivate less productive crops resulting in lower efficiency of land use. Marginal productivity of employed labour is significantly positive indicating that the transfer of labour from agriculture to industry would reduce agricultural output.

B. The Doctrine of Resource Use Efficiency

There is a lot of controversy in the development literature regarding the allocative efficiency of factors of production in traditional agriculture [13, 20]. The traditional notion is that farmers in underdeveloped countries are not rational and efficient in the sense that they do not equate input prices according to their marginal productivity and so output can be increased with the re-allocation of existing resources. Schultz in his recent study has, however, shown that there are few inefficiencies that could be found in the allocation of factors of production. He has attributed the low productivity of agriculture in the under-developed countries to the extremely low rates of return on the traditional factors of production.

Our study tends to support Schultz's theory of 'poor but efficient' farms. Although input prices are not determined by their marginal productivities, the farmers do not employ the inputs beyond a level at which marginal productivity of the input is less than the input price. In all the 95 farms studied marginal productivity of labour is 4.59 which is higher than the average wage rate[10] but not significantly different from it statistically. The marginal productivity of water and fertilizer is higher than their prices but these inputs are rationed by the government and so the farmers cannot apply more of these inputs than available although larger application would increase their profits.

C. Policy Implications

Our study tends to suggest a number of policy measures by which both output and employment can be increased. First, the introduction of "selective mechanisation" in the area can reduce seasonal labour shortage without increasing total unemployment. By reducing the peak labour requirements over short periods of time, this would increase the practice of double cropping in the larger farms and cultivation of more productive less labour-intensive crops. This would not only increase output per acre but also employment per acre of land over the whole year. However, care should be taken that this does not lead to complete mechanisation of agriculture which would not only reduce labour requirement during the peak seasons but also in the slack season and would result in substantial reduction in the labour requirement per acre. This tendency can be checked

---

[10] Agricultural wage rate (cash plus kind) varied between 3·00 and 4·50 Taka.

by suitable policies. For example, subsidies can be given on threshers rather than on tractors which is used in a number of agricultural operations, ploughing land, harvesting crops, transporting them from the field etc.

Secondly, both land and labour productivity can be increased by changing the crop cycle in such a way as to turn agriculture into a continuous operation in which the demand for labour is evenly distributed throughout the year. At present agriculture in the country is purely dependent on monsoons, so the present crop cycles and seeds are so designed as to adjust with the monsoons which result in sowing and harvesting the crops within a few periods during the year. So changing the present system requires perfect control over water which can be accomplished by widespread flood control and irrigational schemes. At the same time research efforts should be intensified to innovate new seed varieties which are of shorter maturing periods and which can be grown at any time during the year. This would ease the labour bottleneck and increase the cropping intensities throughout the year.

Finally, radical land reform policies which put a ceiling on land-holding at a reasonably low level can also increase both output and employment in agriculture. The study indicates that it is the 2.5 to 5.0 acre size group of farms which are most productive in the use of land as well as other factors of production, so any policy that increase the percentage of land cultivated by this size group would increase overall productivity in agriculture. This can be achieved by taking away lands from the larger farms and distributing them among the very small holders and landless peasants[11]. Since both labour utilisation and labour productivity is higher in this group such policy would also increase labour absorption in agriculture with an increase in labour productivity.

VII. SUMMARY AND CONCLUSIONS

This is a study of productivity in agriculture by farm size in 95 farms at 'Phulpur' in Bangladesh. It would not be appropriate to draw any definite conclusion for Bangladesh as a whole by studying only 95 farms in one area. So the results of this study should be taken as indicative rather than conclusive.

The main findings of the study are given below :

(1) Productivity of land is higher for the smaller farms whatever measure of land is taken —gross cultivated land or net cultivated land. Productivity of land

---

[11] The Government of Bangladesh recently put a ceiling on land holding at 33·00 acres. But the effect of this policy will be very marginal as the portion of land held by farms over 33 acre size is insignificant.

is the highest for the 2.5 to 5.0 acre size group. The inverse relationship between farm size and productivity was also found statistically significant by relating 'output per acre' of each farm to its size. Labour productivity is also the highest in the 2.5 to 5.0 acre size group.

(2) Higher productivity of land in smaller farms is mainly due to the allocation of relatively larger amounts of land to the more productive crops than the larger farms and only to a lesser extent due to higher output per acre of individual crops.

(3) This type of land allocation can be explained by the existence of labour shortage in the larger farms. It has been estimated that even with this type of land allocation about 90 percent of the available family labour is required in farm operations during the peak season in the area, i. e., in November-December and it is difficult to draw more labour from outside family during the peak season than during the off seasons. Faced with labour shortage the larger farms thus devote relatively more land to the crops wihch are less labour intensive and/or which does not require large application of labour in few periods of short duration. And since these crops are also less productive both in land and labour this tendency has resulted in relatively low productivity in land and labour in larger farms than in smaller ones.

(4) Even if we consider the 'total factor productivity' in agriculture, the 2.5 to 5.0 acre farms appear to be the most efficient group.

The results, thus, indicate that any agricultural policy that increases the percentage of land held by the small farms would increase productivity and agricultural growth. Such policy would also increase agricultural employment without reducing labour productivity. Agricultural output and employment could also be increased by introducing 'selective mechanisation in agriculture' which would ease labour shortage during peak periods or by changing the crop cycles in such a way as to turn agriculture into continuous operation over the year.

Appendix A

Estimation of Agricultural Production Function

Production function of the form (8) was fitted by the ordinary least square method to the individual farm data for 'All Farms' as well as for the four size groups of farms. The estimated coefficients of the independent variables along with their standard errors and the value of R^2 in each equation are presented in Table A-1.

TABLE A-1

ESTIMATED COEFFICIENTS OF THE INDEPENDENT VARIABLE IN PRODUCTION FUNCTION

$$Q/L = A\,(N/L)^{B_1}(C/L)^{B_2}\,U$$

Size Group (in acres)	Estimated Values of the Coefficients of Log N/L	Log C/L	R^2	Degrees of Freedom
0—2.49	.6634**	.2263**	.70	21
	(.134)	(.042)		
2.5—4.99	.4900**	.2764**	.57	33
	(.161)	(.050)		
5.0—7.49	.7419*	.1214	.66	13
	(.291)	(.068)		
7.5 & over	.6135	.1437	.30	11
	(.379)	(.111)		
All Farms	.6063**	.2149**	.60	87
	(.099)	(.028)		

Values in the parentheses are the standard errors of the coefficients.

** significant at 1% level.

* significant at 5% level.

As indicated by the value of R^2, these two independent variables explain sixty percent of the variations in output per acre in 'All Farms'. In two out of four size groups of farms the degree of variation explained by these two variables is more than sixty percent. Only in the largest size group of farms the value of R^2 is very low. Since this group contains more heterogeneous farms in respect of size than the other three groups of farms, the size difference perhaps plays an important role in explaining the variation in output per acre but we have not taken it as an explanatory variable in the equation.

The output and input data for individual farms on which the function was fitted were obtained by aggregating data for different crops grown by a farmer. Thus our aggregate production function would be influenced by production functions of individual crops. There is at least one crop, namely Irri-8, in the area where technological progress is supposed to have taken place and so there might have been a shift in production function. Since we have aggregated it with the other crop we should use a shift variable to represent its effect. To examine whether it makes any difference we also fitted the function in the following form:

$$Q/L = A\,(N/L)^{B_1}\,(C/L)^{B_2}\,e^{\lambda Z + U} \qquad (11)$$

where, Z is the shift variable and was measured by the percentage of total cultivated area under Irri-8. λ is the coefficient of the shift variable. The estimated coefficients of the independent variables are given in Table A-2.

TABLE A-2

ESTIMATED COEFFICIENTS OF PRODUCTION FUNCTION WITH A SHIFT VARIABLE

Size Group (in acres)	Estimated Coefficients of Log $^N/_L$	Log $^C/_L$	Z	R^2
0—2.49	.715	.257	—.220	.70
	(.153)	(.508)	(.299)	
2.5—4.99	.497	.256	.078	.57
	(.164)	(.074)	(.211)	
5.0—7.49	.401	.032	.768	.84
	(.229)	(.017)	(.213)	
7.5 & over	.554	—.018	1.088	.57
	(.313)	(.113)	(.430)	
All Farms	.583	.172	.276	.63
	(.098)	(.033)	(.118)	

Values in the parentheses are standard errors of the coefficients.

The inclusion of the shift variable improves the explanatory power of the equation only in the two groups of farms at the upper end. The coefficient of the shift variable is also significantly different from zero in these two groups. However, there are serious doubts about the reliability of the estimated coefficients of log C/L and Z in this equation because these two variables are highly correlated with each other as can be seen from the correlation matrix of the independent variables given in Table A-3. The reason is that the production of Irri-8 is highly water and fertilizer intensive and it is one of the two crops in which water and fertilizer were applied in the area. So the effect of cultivating Irri-8 on output per acre is to some extent reflected by the 'water and fertilizer' variable which is already included in the production function. We, therefore, decided to calculate the marginal productivities of the inputs from the coefficients in Table-A-1 rather than from those in Table A-2.

TABLE A-3

CORRELATION MATRIX OF THE INDEPENDENT VARIABLES

Size Group	Variables	Log N/L	Log C/L	Z
	log N/L	1.00	.02	.08
0—2.49	log C/L	.02	1.00	.40
	Z	.08	.40	1.00
	log N/L	1.00	.01	.01
2.5—4.99	log C/L	.01	1.00	.53
	Z	.01	.53	1.00
	log N/L	1.00	.38	.43
5.0—7.49	log C/L	.38	1.00	.45
	Z	.43	.45	1.00
	log N/L	1.00	.01	.01
7.5 & over	log C/L	.01	1.00	.36
	Z	.01	.36	1.00
	log N/L	1.00	.08	.06
All Farms	log C/L	.08	1.00	.35
	Z	.06	.35	1.00

Appendix B

TABLE B-1

DISTRIBUTION OF FARMS AND LAND ACCORDING TO LAND OWNERSHIP

Size of Land Owned (in acres)	No. of Farms	Percentage of Farms	Percentage of Land Owned
0—2.49	40	42	12
2.5—4.99	29	31	27
5.0—7.49	11	12	16
7.5 & over	15	16	45

TABLE B-2

'OUTPUT PER ACRE' OF MAJOR CROPS BY SIZE

(in taka)

Size Group (in acres)	Aus	Aman (Trans.)	Aman (Broad.)	Boro (Trad.)	Boro (Irri-8) (Improved)	Jute
0—2.49	228	315	280	553	841	341
2.5—4.99	211	299	193	541	840	316
5.0—7.49	213	309	109	481	874	290
7.5 & over	163	348	126	447	832	276

TABLE B-3

LABOUR USE PER ACRE IN MAJOR CROPS BY SIZE

(in man-days)

Size Group (in acres)	Aus	Aman (Trans.)	Aman (Broad.)	Boro (Trad.)	Boro (Irri-8) (Improved)	Jute
0—2.49	48	41	32	44	74	90
2.5—4.99	41	37	27	54	67	82
5.0—7.49	43	40	18	54	62	99
7.5 & over	41	38	25	45	63	89

REFERENCES

1. Bhagawati, J. N. and Chakrabarti, S., "Contribution to Indian Economic Analysis—A Survey", *American Economic Review*, September 1969.
2. Battacharya, N. and Saini, G. R., "Farm Size and Productivity", *Economic and Political Weekly*, June 1972.
3. Crosson, P. R., *Agricultural Development and Productivity*, John Hopkins Press for Resources for the Future, Inc. 1970.
4. Jorgenson, D. M., "Surplus Agricultural Labour and the Development of a Dual Economy," *Oxford Economic Papers*, November 1967.
5. Government of East Pakistan, Ministry of Agriculture, *Master Survey of Agriculture,* 1968.
6. Bureau of Statistics, *Statistical Digest of East Pakistan,* 1969.
7. Kahnert, F. and et al., *Agriculture and Related Industry in Pakistan*, OECD, 1970.
8. Kendrick, J., *Productivity Trends in U.S.*, NBER, 1961.
9. Khan, A. R., *Economy of Bangladesh*, Macmillan, 1972.
10. Khusro, A. M., "Returns to Scale in Indian Agriculture", *Indian Journal of Agricultural Economics*, July-December 1964.

11. Lewis, W. A., "Economic Development with Unlimited Supplies of Labour", *The Manchester School of Economic & Social Studies*, Vol. 22, No. 2, May 1954.

12. Mazumdar, D., "Farm Size and Productivity", *Economica*, May 1965.

13. ——————., "On the Economics of Relative Efficiency of Small Farmers", *Economic Weekly*, July 1963.

14. Nadiri, I., "Some Approaches to the Theory and Measurement of Total Productivity", *Journal of Economic Literature*, December 1970.

15. —————., "International Studies of Factor Inputs and Total Factor Productivity", *Income and Wealth*, June 1972.

16. Paglin, M., "Surplus Agricultural Labour and Development", *American Economic Review*, September 1965.

17. Rao, H., "Alternative Explanations of the Inverse Relationship Between Farm Size and Output per acre in India", *Indian Economic Review*, October 1966.

18. Rudra, A., "More on Returns to Scale in Indian Agriculture", *Economic and Political Weekly*, Special Number, July 1968.

19. Saini, G. R., "Farm Size, Productivity and Returns to Scale", *Economic and Political Weekly*, June 1969.

20. Schultz, T.W., *Transforming Traditional Agriculture*, New Haven, Yale University Press, 1964.

21. Sen, A. K., "An Aspect of Indian Agriculture", *Economic Weekly*, February 1962.

22. ————., "Size of Holding and Productivity", *Economic and Political Weekly*, February 1964.

Notes and Comments

A Comment on "Fertility, Infant Mortality and Family Planning in Bangladesh"

by

RAFIQUL HUDA CHAUDHURY*

I. INTRODUCTION

The recent book by John Stoeckel and Moqbul A. Choudhury on *Fertility, Infant Mortality and Family Planning in Bangladesh* (Oxford University Press, Dacca, 1973) is based on the results of a survey conducted in 1967 under the auspices of Bangladesh Academy for Rural Development, Comilla. The major objectives of the survey were to draw inferences regarding the probable impact of the Academy's family planning programme[1] upon the rate of pregnancy and fertility retrospectively over the period between 1958 and 1967 and to assess the degree of relationship between socio-economic-cum-demographic variables and norms of family size and knowledge, attitudes and practice of family planning. The book is divided into eight sections and of these, the section on *Trends in Pregnancy and Fertility* is the most important one because in it the authors evaluated the probable effect of the Academy's family planning programme upon the rate of pregnancy and fertility. This evaluation is the central theme of the survey on which the present work is based. Therefore, I have chosen the section on the *Trends in Pregnancy and Fertility* for evaluation in the present paper.

The findings of the study showed that the rate of pregnancy and fertility has declined by 27% between 1958 and 1967 (p. 12)[2]. To be more specific, the total number of births fell from 8529 per 1000 married women in the reproductive ages (measured from 12 to 44) in 1958 to 6212 in 1967 (p. 14). The corresponding

---

*Rafiqul Huda Chaudhury is a Research Demographer at the Bangladesh Institute of Development Economics. The author acknowledges his thanks to Drs. S. R. Bose and M. R. Khan of the Bangladesh Institute of Development Economics and Lincoln C. Chen, Population Officer of the Ford Foundation in Bangladesh, for their helpful comments on an earlier draft.

[1] The programme was introduced in Kotwali Thana of Comilla District (Bangladesh) in 1961.

[2] Page numbers appearing in the parentheses refer to the work under review.

decline in pregnancy is from 9618 to 7029 (p. 13). In other words, there is a reduction of little over 2 children or 2 pregnancies per woman during the period between 1958 and 1967.

This fall in the rate of reproduction as inferred by the authors, is the outcome of a family planning programme sponsored by the Academy. In the words of the authors, "the results reflect the impact of the Organiser approach to family planning as well as the Commercial Distribution Programme" (p. 18)[3]. Here, we will examine how far this inference is justifiable. The question will be examined from four points of view : (i) selection of sample ; (ii) methodology of evaluation ; (iii) internal validity and (iv) problems of retrospective survey.

II. SELECTION OF SAMPLE

The result of a study may be influenced among other things by the way the study population is selected. In order to study the probable impact of a family planning programme the authors have selected 20 villages out of the total 247 villages of Kotwali Thana, on the basis of probability sampling (p. 9). To judge the effect of the programme, it is expected that one would select the sample from a population which is exposed to such programmes. According to the authors' count, we find that only 22 villages out of the 247 are exposed to family planning programme (p. 7). Thus selection of 20 villages out of the total 247 on probability basis may also include some villages which are not exposed to such programme. The probable inclusion of some villages which are not exposed to a family planning programme in the study population is utterly meaningless when the purpose is to measure the effect of this programme. The inclusion of such villages may distort the estimate of the true effect of a family planning programme. Therefore, the present study population will not provide a suitable framework for making any judgement on the impact of a family planning programme.

III. METHODOLOGY OF EVALUATION

In this study, the authors have evaluated the probable impact of a family planning programme upon the rate of pregnancy and fertility by examining the trend of these events for the same population over a period of time. The period of time ranges from pre-implementation of the programme to the closing date of the survey (1958 to 1967). The observed difference in the rate of pregnancy and fertility between the year of 1958 and 1967 has been attributed by the authors to the probable impact of a family planning programme. However, the method

---

[3] Organiser and Commercial Distribution Programmes are the strategies employed by the Academy for Rural Development, Comilla to propagate family planning activities,

of evaluation employed by the authors suffers from one major drawback. Under this method, one would not be able to isolate the impact of the family planning programme from the secular decline in fertility. In other words, the method of evaluation employed by the authors does not provide any guarantee whether the observed decline in pregnancy and fertility rates during 1958-1967 would not have occured even in case of having no family planning programme. There could be decline in the rate of pregnancy and fertility also in the absence of a sponsored family planning programme—an example of which can also be traced from the data on Bangladesh. For a sample of 4200 families in Central Bangladesh[4], Schultz [I] found 20% reduction in marital fertility (measured from 15 to 44) from 1953-1956 to 1957-1960. The women in the above study were not exposed to any sponsored family planning programme. Extrapolating the finding of Schultz, we can argue that the observed decline in the rate of pregnancy and fertility for the currently married women in the sample of Stoeckel and Choudhury could have also happened in the absence of the Academy's family planning programme. In order to establish the impact of the Academy's family planning programme upon the rate of pregnancy and fertility, the ideal method would have been to compare the trend of pregnancy and fertility between the acceptors and non-acceptors of Comilla family planning programme. If it was found that the rates of pregnancy and fertility declined only or more sharply among the acceptors than among the non-acceptors, then one could possibly attribute such difference to the probable effect of the family planning programme. However, the above argument is tenable only when the acceptors and non-acceptors are same in all other characteristics excepting their status on practice of family planning. The authors did not make such a comparison of the trend of pregnancy and fertility rate between acceptors and non-acceptors of the family planning programme. In the absence of such a comparison, we cannot attribute the observed decline in the above rates as the probable effect of the family planning programme because such decline could also happen among the non-acceptors of the family planning programme.

Moreover, it is difficult to assess the independent effect of the family planning programme outside the context of other development projects in operation at Kotwali Thana of Comilla District. Among those projects, mention may be made particularly of the women's Education and Home Development and the Cooperative Societies. These projects have direct and indirect effect on the attitude and practice of contraception along with other aspects of life which will,

---

[4] By Central Bangladesh, the author referred to the following districts : Dacca, Faridpur, Comilla and a Southern portion of Mymensingh.

therefore, have consequent effect upon the rate of decline in pregnancy and fertility. Under the circumstances, unless the effect of these projects on pregnancy and fertility are isolated, one cannot assess the independent effect of the family planning programme on the aforesaid reproductive behaviour.

IV. INTERNAL VALIDITY

We will examine here how far the inference drawn by the authors regarding the impact of the family planning programme upon the rate of pregnancy and fertility is consistent with the data used in the study.

First, we will look at the degree of association between the rate of decline in pregnancy/fertility and the activities of the programme. If family planning programme has an effect on the rate of pregnancy and fertility, it is expected that this effect will be more dominant during the peak period of the programme in comparison to the dull period. In other words, the rate of decline in fertility and pregnancy will vary positively with the rigorousness of the programme. Let us examine how far the above assumption is supported by the data.

The Comilla family planning programme was launched under two approaches viz., (i) the Organiser approach and (ii) the Commercial Distribution approach. Organiser approach was tried at the early phase of the programme. It was started in 1961 as a pilot project in six villages and since then gradually spread to 22 villages by 1964. Under this approach, each village used to nominate a local woman as the principal organiser of the family planning activities. Thus there were only 22 such organisers entrusted with the task of family planning activities for 22 villages. Their main task was to visit local women and to discuss with them the importance of family planning and sell the contraceptives. This was indeed a huge task for a single woman to perform. The programme, however, made headway in 1964 when Commercial Distribution approach was initiated. In the words of the authors, "In 1964, the Academy expanded its efforts in family planning by starting the second programme, the Commercial Distribution approach" (p. 144). The Commercial Distribution approach was multi-faceted. Under this scheme unlike Organiser approach both male and female agents were recruited for the distribution of contraceptives and there were 600 such agents as against 22 agents under Organiser approach. Contraceptives were available at regular shops. There were supervisors to check the work of the agents and find means to increase the sale of contraceptives. In addition, the Commercial Distribution approach laid emphasis on extensive mass media campaign in order to popularize the family planning programme in the locality—a departure from Organiser approach. It is, therefore, evident that the family planning activities reached its peak in the period of Commercial Distribution approach (i. e., the period following 1964) in comparison to the period under Organiser approach (i. e., the period prior to 1964). Therefore, in terms of programme activities, the period between 1958 to 1964 was relatively less active than the period following 1964. Thus according to our earlier assumption, we would expect that if the family planning programme has any effect upon pregnancy and fertility, it will be more felt after 1964 than the preceeding period. But no such clear picture is evident from the data gathered in this study. It is found that pregnancy and fertility declined by a little over 18% between 1958-59 and 1963-64 and the corresponding figure is a little over 10% between 1963-64 and 1966-67 (pp. 13, 14). The data, therefore, show no monotonic trend of relationship between programme activities and the rate of decline in pregnancy and fertility. Moreover, the rate of decline is not uniform throughout the period of observation. As a matter of fact, the rate of fertility and pregnancy went up during 1963-64 to 1964-65. This is contrary to our expectation and no explanation for such up-turn trend is offered by the authors. This further demonstrates the inadequate correlation between programme activities and the trend of pregnancy and fertility.

The success of a family planning programme in regulating fertility depends among other things on the type of contraceptives used and how regularly they are used and how many women in the reproductive period accepted the plan. According to the evidence gathered in this study, we find that the programme under review has mainly concentrated on non-clinical contraceptives such as condoms and foam tablets (pp. 4, 8). These are not very effective methods in regulating fertility as those of IUD or oral pills. There is also no statistics on how regularly the condoms or foam tablets were used by the participants. Moreover, only 4% and less than 6% of the study population are found to be current and ever users of contraceptions, respectively (p. 41). These figures clearly indicate very little effect of the Academy's family planning programme upon the study population in terms of use of contraceptions and these figures are really too low to cause the observed 27% decline in pregnancy and fertility rates as the authors think.

V. PROBLEMS OF RETROSPECTIVE SURVEY

The authors of this study have evaluated the trends in pregnancy and fertility rates over the period between 1958 and 1967 on the basis of retrospective pregnancy histories of the women in the sample. The results based on retropsective data suffer from various shortcomings. Of these, mention may be made particularly of (i) recall lapse and (ii) telescoping bias. First, in most retrospective techniques, the data would be biased for failure on the part of respondents to recall the past events and such recall error may inflate or deflate the estimate of the trend of an event depending on which point in time, the recall-error is most acute. To this charge, the authors have argued that the chances of recall-lapse are likely to be more as one goes back in time and if this is so, the estimated decline in the rates of pregnancy and fertility are rather under-estimated than over-estimated since the earliest rates would be biased by under-reporting (p. 18). The authors' assumption of more under-reporting of distant events than of closer events though seems to be logical but not conclusive as the dynamics of direction of bias is not known in the context of Bangladesh. **Second**, telescoping bias is another serious shortcoming associated with retrospective data. This bias stems from the failure on the part of respondents to place the old events to their appropriate time of occurance ; and thereby lump or telescope them together and thus artificially inflating or deflating the events under observation as one goes backward in time. For example, in the present case, the events of pregnancy and fertility of 1958-59 may have been over-estimated because the figures of 1958-59 might have included some events of the earlier dates. If this is so, the present estimate of decline in fertility and pregnancy is over-estimated because the rates of 1958-59 may have been over-reported. Similarly, misplacing of events in terms of their actual time of occurance may also deflate the estimate of an event. Any of the above factors along with others such as pattern of migration—in and out, failure to include women who have died due to childbearing complications (maternal death) in the sample etc. may be associated *ex post facto* with the notable year to year changes in vital rates, but consideration of such changes in terms of any cause and effect relationship would not be justified given the limitations of the data.

Thus, in view of the bias in sample selection, non-scientific method of evaluation, low correlation between programme activities and the trend of pregnancy and fertility, very low current and ever users of contraceptions, relatively less use of effective contraceptions, lack of information on regularity of use of contraceptions and the bias associated with retrospective data, we can say that the inference drawn by the authors regarding the probable effect of the Academy's family planning programme upon pregnancy and fertility is overstated.

REFERENCE

1. Schultz, T. Paul, "Retrospective Evidence of a Decline of Fertility and Child-Mortality in Bangladesh", *Demography*, Vol. 9, No. 3, 1972, pp. 415-430.

Book Review

Woman's Role in Economic Development by Ester Boserup, (London : George Allen & Unwin Ltd., 1970).

Woman's Role in Economic Development is one of the few studies concerned with what happens to women, as socially and economically productive members of society, when a nation begins to modernize its agricultural and urban life. Written by a distinguished Danish economist, Ester Boserup, this book should be read by all those involved or interested in the economic and social development of poorer nations. Her analysis indicates that "development" frequently causes a decline in the productivity and status of women. If this is so—and she is the first to suggest that more basic information and further study are needed to determine the validity of her conclusions—then planners and their advisors must become more conscious of the effects their plans have on women and weigh what is being lost against what is being gained both on the economic and human scale.

Boserup looks at what has been happening to women in developing nations as modernization takes place in the village and the town and in the process of migration from one to the other.

At the village level, in the earlier stages of development, families produce and consume their own goods, dividing labor along sex lines which, though they differ from culture to culture, each culture considers "natural". Among the areas she is considering—Asia, Africa, Latin America—Boserup describes two basic kinds of agriculture, differentiated in part by the roles women play. Women do much of the work involved in farming in many parts of Africa (and a few in Asia and Latin America) where the land is sparsely populated and there is shifting cultivation on small plots. Where agriculture is dominated by women, wives command a high bride price; they work hard, often are expected to support themselves, but have freedom of movement and some economic independence from the sale of their products. Male-dominated agriculture, usually in densely populated areas on larger pieces of land, privately owned, is characterized by the use of the plough, work animals and hired labor, which may include poor or low-caste women. The farmers' wives usually live in seclusion, doing work related to harvesting and caring for animals. They are totally dependent on their husbands for support.

While modernization has had negative effects on both groups of women, it is the former that has been most obviously neglected. Many colonialists, Christian missionaries and American and European advisors have assumed, even where the culture indicated otherwise, that farming is man's work and, by giving opportunities exclusively to men and even, in some cases, undercutting women's traditional rights to own land by their male-oriented land reform policies, have contributed to lowering the status of women who, not allowed to move ahead with the men, are then perceived as "backward". Men have come to monopolize new agricultural methods and use them for cash crops while women, the original farmers, who have not been encouraged to go to school or given the chance for agriculture courses or extension services, continue to use traditional methods for food crops.

Other economic activities of women in developing countries vary from culture to culture, but modernization seems to have neglected or hurt them all. In the traditional trading sector there are especially wide variations in the participation of women from one country to another. In Ghana, for example, 80% of the labor force in trading is female while in Pakistan the figure is 2%. But the trend in many developing nations, whether traditional trading has been predominantly female or not, is that jobs in the modern trading sector go to men.

In countries where the culture prevents women from doing anything outside the home, they may work in home or cottage industries, an initial step in entering the labor force. Where many women are available for such work and the price of their goods must compete with modern industry, the wages of course are quite low. Men, who may have been working with women in home industry, go to factories when they open up and, with an increase in wages and productivity, attain an increase in status. And if factories take over from home industries, women lose their jobs.

In the urban world where factory work is available, women again are relegated to lower status and productivity. In modern industry, Boserup points out, there are only two kinds of jobs, and in developing countries the salary differential between them is high. One is for those who have had some training and will have a chance for promotion ; the other is for the unskilled or "helpers" who will not have a chance to move ahead. Though men are hired for both kinds of jobs, women as a rule are hired only for the latter.

The employment situation of educated women in developing countries is new, but still, according to Boserup, a trend is developing. Few women anywhere are in administrative jobs ; the percentage is higher where Americans have been influential. The ratio of women in the professions seems to be related to the ratio of women in the student body, but the professions women concentrate in are medicine, teaching and nursing. In Asia and Africa at the stage of development when the demand for women in these professions exceeds supply, few women take clerical jobs. But as educated women begin to have difficulty finding jobs in "appropriate" professions, the pull is toward office jobs. Educated middle class women seem to be turning to low grade clerical jobs which, as Boserup points out, may improve their status vis-a-vis their husbands by giving them some measure of economic independence, but will lower their status in the labor market.

In her concluding chapters Boserup looks at development policies that would benefit both women and society as a whole. She pays special attention to the question of employment of urban women whose economic productivity has often been lost in the process of migration from the village. Most of the work women did as part of subsistence activity in the rural area must be paid for with cash in the city. As much as one-half to two-thirds of the husband's income from his city job is spent on goods and services that were produced at home in the village, at least in part by the woman. Now she stays at home and his productivity is offset by the loss of hers. Even women who were employed in bazaar or service sectors in towns tend to decline in economic productivity as a result of migration to the city.

Yet many planners, almost as a matter of course (or cultural bias) argue against employment of urban women because of high unemployment among men. Boserup presents some important counter-arguments. First of all, she points out that thinking about unemployment is often confused. Several surveys in developing countries indicate that unemployment among new unskilled migrants is relatively low either because news about the urban job situation is available in the villages or because migrants unable to find jobs return to the villages, where they usually can find at least seasonal work (and where, if the agricultural sector develops as it should, there will be need for their labor). If urban women are more widely hired for jobs, it is possible that fewer unskilled laborers will leave their villages.

Unemployment among educated males in cities is higher. Boserup sees this as a natural phenomenon when the numbers of educated are continually expanding but the literate are not yet ready to take jobs traditionally held by the illiterate. (Among literate populations, of course, all jobs are held by the literate). These people may be quite noisily against the hiring of women but to yield to them is to postpone, through injustice, an unavoidable step in the process of development. It is an urgent step in light of the need for literate workers to remain in the village.

In addition, hiring urban women whose husbands are already employed will cut down the amount of costly urban infrastructure required when an urban family produces only one worker.

To prevent further decline in the status and productivity of women with modernization, Boserup emphasizes the need for proper education and training for women. "In the beginning", both men and women were economically productive and both sexes were equally illiterate and superstitious. Now as the result of modernization men are getting formal training and education and using modern techniques while women continue to get educated in old ways by their mothers and, as a result, are perceived as backward. To avoid creating a backward class whose decline in status and productivity are bound to offset socially and economically more visible gains, developers must provide and encourage education and job training for women. Jobs for rural women are a necessity now, to provide an incentive for educated women to stay in the village and to offer some alternative to achieving status besides having babies. Jobs for urban woman will become increasingly important because, unlike the situation in the West at the stage of industrialization, taking care of a family will not be so time-consuming and women will be freer to work outside the home.

Boserup's study, supported by invaluable tables reflecting the pattern of female employment in developing nations, reveals a clear trend. No doubt more data is needed from social scientists in specific areas, especially South and West Asia, but equally important is commitment to women as people. It is possible that many social scientists and planners have class and cultural biases about the role of women in society that keep them from seeing what is happening to women as modernization takes place. Reading Boserup's book may help remove these biases.

Sondra A. Zeidenstein

INDEX*

---

* Vol. I, 1973

(R) : Review Article

THE DEVELOPING ECONOMIES

QUARTERLY JOURNAL OF
INSTITUTE OF DEVELOPING ECONOMIES
42, Ichigaya-Hommura-cho, Shinjuku-ku
TOKYO, JAPAN

Vol. XI June 1973 No. 2

Subscription price (4 issues) : $26.00 (post free)
Single copies : Ordinary issue $6.00 ;
Special issue $8.00 (post free)

Orders may be sent to the sole agent :
MARUZEN COMPANY, LTD.
P. O. Box 5050, Tokyo International 100-31, Japan

SOCIAL AND ECONOMIC STUDIES

Published by

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF THE WEST INDIES
JAMAICA, WEST INDIES

A journal devoted to the publications of research and discussion on agricultural, anthropological, demographic, economic, educational monetary, political and sociological questions, with emphasis on the problems of the developing territories, particularly those in the Caribbean.

Vol. 22 **June 1973** **No. 2**

Subscription Rates :

Per volume : J$6.00, W. I. & T. T. $14.40, £3.00, U.S. $7.50

Single number : J$2.00, W. I. & T. T. $4.80, £1.00, U.S. $2.50

Subscriptions and orders of back numbers should be addressed to :

The Publications Editor, *Social and Economic Studies*,
Institute of Social and Economic Research, University of
the West Indies, Mona, Kingston 7, Jamaica, W. I.

SOCIAL AND ECONOMIC STUDIES

Published by

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF THE WEST INDIES
JAMAICA, WEST INDIES

A journal devoted to the publictions of research and discussion on agricultural, anthropological, demographic, economic, educational monetary, political and sociological questions, with emphasis on the problems of the developing territories, particularly those in the Caribbean.

Vol. 22 September 1973 No. 3

Subscription Rates :

Per volume : J$6.00, W. I. & T. T. $14.40, £3.00, U.S.$7.50

Single number : J$2.00, W. I. & T. T. $4.80, £1.00, U.S.$2.50

Subscriptions and orders for back numbers should be addressed to :
The Publications Editor, *Social and Economic Studies*,
Institute of Social and Economic Reserach, University of
the West Indies, Mona, Kingston 7, Jamaica W. I.

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

(Organ of the Indian Society of Agricultural Economics)

Vol. XXVIII **July-September 1973** **No. 3**

CONTENTS

Articles

Tendencies in Relative Economic Efficiency and Their Consequences ... *Robert W. Crown and Vishnuprasad Nagadevara*

Buffer Storage Location Under Economies of Scale *A. S. Rao*

Green Revolution and Farm Employment ... *S. S. Acharya*

Notes

Allocation of Fertilisers Among Crops and Regions in Uttar Pradesh ... *A. K. Chaudhuri and A. S. Sirohi*

A Note on Efficiency in Transitional Agriculture : A Study of Farms in Rural Delhi ... *Uma Shankar Singh and Dayanatha Jha*

Trend in Agricultural Wages in Gujarat ... *Indira Hirway*

Indian Frozen Shrimp in U. S. A. : A Study on Movement of Prices ... *K. Krishna Rao and R. Gopalakrishnan Nair*

Vol. XXVIII **October-December 1973** **No. 4**

CONTENTS

THIRTY-THIRD ANNUAL CONFERENCE NUMBER

Contains the Rapporteurs' Reports and 26 Papers and 50 Summaries submitted for discussion under the following subjects :

1. Integrated Area Development with reference to District Planning.
2. Benefit-Cost Analysis of Agricultural Projects.
3. Agricultural Input Supply Systems including Marketing.

Per copy	**Annual Subscription**
Rs. 5.00 or 12sh. or $1.50 for regular issues and Rs. 7.00 or 18sh. or $2.00 for the Conference Number—postage extra.	Rs. 20.00 or £2.50 or $6.00 —post free.

Subscription and orders for back numbers should be addressed to : The Honorary Secretary, The Indian Society of Agricultural Economics, 46-48, Esplanade Mansions, Mahatma Gandhi Road, Fort, Bombay-1 (India)

ARTHA-VIKAS
Biannual Journal of Economic Development

Vol. IX January-July 1973 Nos. 1-2

CONTENTS

PROCEEDINGS OF AN ALL-INDIA SEMINAR ON THE DEVELOPMENT OF BACKWARD REGIONS WITH SPECIAL REFERENCE TO GUJARAT

Subscription Rates (inclusive of postage) :

Annual :	Rs. 8.00 ; $2.50 ; 15 Sh.
Single Issue :	Rs. 4.50 ; $1.50 ; 9 Sh.

Please address all correspondence to :

Dr. Mahesh Pathak, Managing Editor,
Artha-Vikas, Department of Economics,
Sardar Patel University, Vallabh Vidyanagar, Gujarat, India

ARTHA VIJNANA

Quarterly Journal of the Gokhale Institute of Politics
and Economics, Poona 4—India

Vol. 16 **January 1974** **No. 1**

Contents

Subscription Rates:
(inclusive of postage)

Annual : Rs. 25 ; $7.50 ; 45s.

Single
Issue : Rs. 7.50 ; $2 ; 15s.

Please address all
correspondence to :

The Editor,
Artha Vijnana,
Gokhale Institute
of Politics and
Economics,
Poona 4 (INDIA)

REVUE TIERS—MONDE

Tome XIV, n° 56, Octobre—décembre 1973

LA COOPERATION INTERNATIONALE

Sous la direction du Professeur Georges FISCHER

Une enquête de l'I.E.D.E.S. sur la coopération internationale

X. X. X. : L'Aide de la France aux pays du Tiers-Monde

Jacques FOUBERT : La politique francaise de coopération : une doctrine à concevoir

Stéphane HESSEL : L'Assistance technique multilatérale en 1973

Observations I & II : "Une tâche urgente : mieux former les cadres occidentaux s' occupant du Tiers-Monde" par Gilbert ETIENNE

Daniel VIGNES : L'Aide de la Communauté Economique Européenne aux Etats africains et malgache

DOCUMENTATION

Jean-Pierre EDOUARD
et Michel GAUD : Réflexions sur les analyses des effets de l'aide au développement

Philippe HUGON : L'impact de l'aide sur le développement. Le cas de Madagascar

Charles ANDRÉ : Les accords internationaux sur les produits de base : une controverse

Panayotis ROUMELIOTIS
et Monica WEMEGAH : Les négociations commerciales

CHRONIQUE INTERNATIONALE

Georges FISCHER : Le non-alignement et la Conférence d'Alger. Septembre 1973

BIBLIOGRAPHIE

Direction-Rédaction : Institut d'Etude du Développement Economique et Social, 58, Boulevard Arago—75013-PARIS

Abonnements et vente : Presses Universitaires de France, 12, rue Jean de Beauvais 75005-PARIS

1973 :	France : 70,00	Etranger : F. 78,00
1974 :	France : F. 76,00	Etranger : F. 85,00

TERZO MONDO

Anno VI **dicembre 1973** **n. 22**

Sommario

TERZO MONDO
Direzione, Redazione, Amministrazione:
Via G. G. Morgagni, 39.-20129 Milano.

Abbonamenti 1974:
Ordinario, L. 4.000 ; d'amicizia, L. 5.000 ; sostenitore, L. 10.000.

SUBSCRIPTION/ABONNEMENT/SUSCRIPCION
US $ 8. By bank or money orders.

SUBSCRIPTION RATES

for

THE BANGLADESH ECONOMIC REVIEW

INLAND

General	Taka 5 per issue Taka 20 per year
Students	Taka 3 per issue Taka 12 per year

FOREIGN

Annual	US $ 10.00 or UK £ 4.00 ; or equivalent thereof in other currencies
Single copy	US $ 2.50 or UK £ 1.00 ; or equivalent thereof in other currencies

Air postage extra. Payments to be made through bank drafts/postal orders.

Printed at ABCO PRESS, 6-7 **Aulad Hossain Lane,** Dacca-1 and published
by the Bangladesh Institute of Development Economics, Dacca.

THE
BANGLADESH INSTITUTE OF DEVELOPMENT ECONOMICS

Adamjee Court, Motijheel Commercial Area, Dacca-2, Bangladesh.

The Institute carries out basic research studies on the economic problems of development in Bangladesh. It also provides training in economic analysis and research methodology for the professional members of its staff and for members of other organisations concerned with development problems.

THE BANGLADESH ECONOMIC REVIEW

Volume II April 1974 Number 2

Articles

Note

The Quarterly Journal of
THE BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

Manuscript and editorial correspondence should be addressed to the Board of Editors, *The Bangladesh Development Studies,* Adamjee Court, Motijheel Commercial Area, Dacca-2, Bangladesh. Style instructions for guidance in preparing manuscript in acceptable form will be provided upon request.

The Bangladesh Economic Review

Volume II April 1974 Number 2

Articles

Note

Capital Utilization and Optimal Shift Work[1]

by

GORDON C. WINSTON*

A capital stock is intended to be used part of the time and left idle part of the time—in U. S. manufacturing, capital is idle more than 70 percent of the time when aggregate demand is strong [43]. This paper will show that the optimal level of capital utilization is an economic variable that depends primarily on relative factor prices, on their systematic changes over regular rhythms and on elasticities of substitution. Since the same output can be produced by a small capital stock operated much of the time or by a large capital stock operated little of the time, the investment decision embodies a decision on (simultaneously) the size of the capital stock and the level of its utilization—consequently profit maximizing utilization is usually far less than the engineering maximum.

This is a matter of considerable urgency for less developed countries where a critical scarcity of capital coexists with levels of utilization well below those of capital-rich advanced countries : in Pakistan, manufacturing capital is used about 15 percent of the time in contrast to the United States level of roughly 25 percent [11, 45]. Less urgently, but perhaps of more interest to economic theory, the fact that optimal capital utilization is an economic variable has considerable implications for that broad range of problems we analyze with production functions under changing factor prices—technical change [1, 37], optimal growth

---

[1] Of the numerous people on whom I have tried out these ideas, Howard Kunreuther, A. R. Khan, Nurul Islam, Matilal Pal, John Mellor, Stan Wellisz, Nicholas Georgescu-Roegen, John Sheahan, Henry Bruton, John Power and Karlis Goppers have been most critical, encouraging and demanding. The work was done while I was on leave from Williams College, first at the Pakistan Institute of Development Economics in Karachi and Dacca, then at Nuffield College, Oxford, supported by the Ford Foundation through the Yale University Pakistan Project and Ford Grant 720-0234.

*Professor of Economics, Williams College, Williamstown, Massachusetts.

[18, 37], development planning [16], productivity growth [9, 19] and investment theory [26, 38].

This model departs from conventional production theory only to the extent necessary to make the utilization and idleness of capital a variable subject to optimization. To do this, however, requires that production be viewed explicitly and consistently as a "pure flow" relationship between factor service and output flows since, with utilization variable, there is no unique association of factor stock and factor service flow [12, 18]. Analysis of utilization also requires that the prices of factor service flows be specified with more care than is usual. It is reassuring that with the conventional assumption—that utilization will not vary with economic forces—all the unusual specifications of variables in this model collapse back into quite familiar forms.

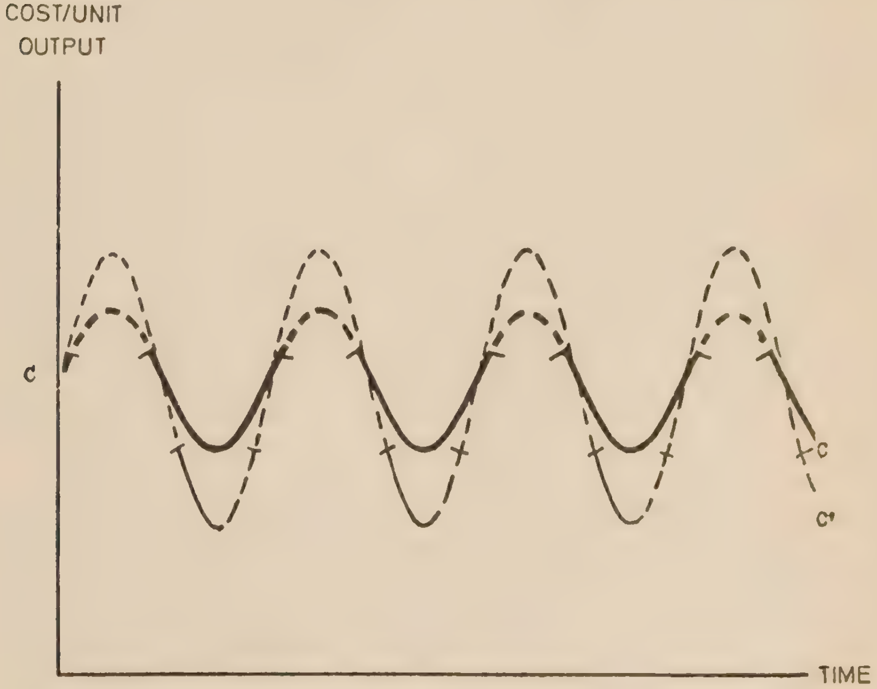
This paper is not concerned with unexpected events that may keep firms involuntarily from operating as much as their optimal levels of utilization would require—though most of the literature on capital utilization is [30, 43]. These events are varied and often interesting but they have received a disproportionate share of the analytical attention while the more fundamental question of the determinants of the optimal level of intended utilization *per se*—as part of the investment decision—has been neglected. A number of other common aspects of capital or 'capacity' utilization analyses are explicitly omitted from this model—the firm is in perfect competition in product and factor markets; there are no changes in product demand, in regular peaks [35], or stochastically [29], or with steady growth [6, 16]; there are no economies of scale [17, 23] and the future is known with certainty [35].

I.

Because the analysis of utilization is unfamiliar, it is worthwhile to sketch its general features before dealing with its specific embodiment in this model.

Profits are maximized by leaving capital idle part of the time because the prices of some inputs to production vary rhythmically and predictably and, anticipating these in investment, it may pay to "overbuild" the capital stock in order to produce all output during periods of low input costs. Labour, electricity, light, agricultural products, temperature are inputs to production processes that have rhythmic price patterns. Awareness of rhythmic price patterns has greatly been increased by recent studies by Nerlove [28], Stigler and Kindahl [35-a] and others.

In Figure 1 the solid line CC shows a simple, smooth periodicity in the cost of an input "L" over time. There is no trend, no irregularity, no uncertainty. If the input described by Figure 1 is important in the costs of production and the amplitude of the rhythm is sufficient, profits will always be maximized by operating the process—indicated by the solid parts of the line—only during low cost periods and leaving it idle—indicated by the broken parts—during high cost periods. When such a cost rhythm is fully anticipated in investment, a larger capital stock will be installed than is "technically necessary" in order that a higher rate of output can be maintained during low cost operating periods and the process can be shut down during high cost periods.



COST OF INPUT L PER UNIT OUTPUT

FIGURE 1

Given the periodicity of an input cost rhythm, it will be optimal to leave capital idle a greater proportion of the time (a) the greater is the amplitude of the cost rhythm and (b) the more important is this input rhythm in total costs. Compared to CC, the cost rhythm represented by CC′ will reduce optimal utilization (increase optimal idleness) because of its higher amplitude.

The amplitude of an input cost rhythm will be determined by the amplitude of its price rhythm and by the *ex post* substitutability between this and other inputs. For any given price rhythm, the greater is the elasticity of substitution, the greater is the opportunity to sneak out of the factor price increase during high cost periods by substituting other inputs. With high *ex post* elasticities of substitution between capital and labour, for instance, a given plant may be run with a large crew during the day but with a small crew (producing at a lower rate) during nights and weekends with their increased wage rates.

The relative importance of the input cost rhythm in total costs will be determined by the *ex ante* elasticity of substitution and capital intensity. In a process with a low and inflexible capital-labour ratio, for instance, the importance of a given day-night labour cost rhythm will be relatively great and will induce lower capital utilization than in a more capital intensive plant. The higher is the *ex ante* elasticity of substitution, the more the potential cost impact of a given price rhythm can be reduced by reducing use of that factor.

These are the dimensions of a theory of optimal utilization—rhythmic costs, relative factor prices and elasticities of substitution. In this model, we deal with a two factor production function and therefore with only one rhythmic factor price—the wage rate, day and night. And we use a discrete, two-period (shift) rhythm rather than the smooth continuous time rhythms suggested by Figure 1. At this stage, the loss is not great and the gain in comprehensibility is considerable.

Robin Marris' work heavily influenced this analysis by showing that regular day/night wage rhythms due to work-time preferences are a major reason why capital rarely will be installed with the intention that it be utilized as much as, technically, it could be [24].

Others have touched on the issue. Georgescu-Roegen and Jorgenson-Griliches have sought to clarify the relationship of stocks and flows in the production process [12, 13, 19]. Very early, Nicholls studied variable utilization as a means of getting output flexibility in the meat packing industry [29]. Lucas [22] used Marris' analytical framework but applied it to cyclical behaviour with a given capital stock, maximizing the return to capital, thereby obscuring both the importance of relative factor prices and that optimal utilization is anticipated in the investment decision (Phillips [30]).

Kim [20], Taubman-Wilkinson [39], Nadiri-Rosen [26], and Brito-Williamson [3] all described investment models in which some costs are increased and others reduced with increased planned utilization so that idle capital may be optimal. But Kim chose an unlikely *deus ex machina* to change average costs (economies of construction scale raising average costs while avoidance of pre-peak load inventory costs lower average costs with increased utilization). In the latter three, utilization affects costs only through increased depreciation. All four apparently were unfamiliar with Marris' analysis of day/night labour cost rhythms. Nadiri and Rosen included a labour market with overtime wage rates and employment costs per worker, but since they didn't treat time-specific wages or integrate their labour market into the investment model, it served only to establish an optimal average work-day per worker.

Solow's 1962 model vintage capital analysis [37] had a mechanism of use and non-use of part of the capital stock caused by changes in relative factor prices that alter its profitability. And earlier, Solow dealt with capital stock flow and capital aggregation in production functions, but chose to develop the aggregation issue instead of careful stock/flow specification [38].

II.

In planning investment, a price-taking firm seeks to maximize profits in light of :

(a) variability of capital utilization and

(b) the fact that people prefer to work during the day so labour costs rise as utilization increases, extending production into the night.

A. Output and Factor Flows

The flow of output, Q, is a linear homogeneous function of factor service flows, all measured per 'shift' of operation,

$$(1) \quad Q = F(K, L).$$

The production function is unaffected by the time of day; L is man-hours of homogeneous labour ; K is machine-hours of homogeneous capital services (from conceptually standardized machines). The firm owns the capital stock and hires labour.

The maximum capital service flow available in any period is related to the number of those conceptually standardized machines,[2] $\bar{K}$, by an 'engineering' constant, 'a' that describes the period of analysis (which we will take as a single period of the input cost rhythm) and the requirements of time for maintenance,

$$\max K = a\bar{K} .$$

Since I deal only with a daily rhythm here, $a \leq 24$ hours = one day. (For a yearly rhythm, $a \leq 8760$ hours.) We will assume that there is no maintenance and take the day as the time unit of analysis so $a = 1$. We will consider two shifts, each 12 hours, half a day, long. Capital utilization, u, describes the daily machine hours used in production, K, as a proportion of the maximum capital service flow available,

$$u = K \ /\max K \qquad 0 \leq u \leq 1 .$$

u can be read simply as the proportion of the day the capital stock is in use. Generally, capital stock, capital service flow and the utilization of capital are related by

$$(2) \quad K = ua\bar{K} .$$

---

[2] In general, capital letters will denote flows (and their prices) over periods of explicit duration so L describes man-hours per shift, K is machine hours per shift, etc. Capital-bar letters will denote stocks (and their prices) so $\bar{L}$ describes the number of employees, $\bar{K}$ the number of machines, etc. Exceptions to this notation will be clear.

Given the desired daily output, the investment decision will involve the choice, *ex ante*, of values for u and $\bar{K}$ that minimize average costs of production; u will be the optimal level of capital utilization.

B. Factor Prices

To deal consistently with optimal utilization requires more detailed, hence slightly unorthodox, specification of the prices of both factor service flows : the price of labour service flow incorporates workers' preferences for day and night work ; the price of capital service flow is affected by varying utilization. When rhythmic cost changes and variable utilization are ignored, these unorthodox specifications of factor prices become comfortingly orthodox again.

The price of a man-hour of labour service flow is the hourly wage rate. The wage rate varies with the time of day because most of us prefer day-time work and a night wage premium is necessary to overcome those preferences and induce regular night-time labour [14, 24, 25, 41].[3] Since I assume constant demand, production (hence capital use) must start each day when the wage rate is lowest (on day shift) in order to minimize costs. Increasing utilization will extend production into periods of higher wage rates (night shift) so the wage rate w (u) depends on the time of day, therefore the level of utilization,

$$\begin{aligned} w(u) &= w \qquad &&\text{for } 0 \leq u \leq 1/2 \\ &= (1+\beta)\,w \qquad &&\text{for } 1/2 \leq u \leq 1, \quad \beta \geq 0. \end{aligned}$$

The price of capital services is often, if harmlessly, misspecified [3, 19, 26]. In integrating equipment price, interest rate, depreciation and taxes in a "price of capital", Jorgenson and Griliches [19] and Williamson [40] significantly clarified an important part of production theory. Unfortunately, they chose to call their integrated capital price, "the price of capital services", implying that

---

[3] While this two factor model is developed with explicit premium 'wage rates' for night work, higher night-time supervisory salaries or increased management pay for extended night-time responsibility will also bring a higher price for night-time 'labour,' broadly defined(as required by a two factor production function). Since these appear to be more, rather than less, important in underdeveloped countries, the analysis of labour cost rhythms is relevant even when wide spread unemployment reduces the explicit night wage premium to zero [37].

it is the price of a capital service flow—a machine-hour. But in fact, what they specified is the price of owning a capital stock for a period of calendar time, like a day or a year—a cost that accrues whether the capital stock is providing productive services or is idle. (The "owner cost of capital" or "daily cost of owning a unit of capital stock" would have been a more descriptive phrase.)

Since capital utilization is assumed constant in most production analysis, that specification usually makes no difference—the price of a machine-hour is simply a scalar of the daily cost of owning the capital stock when the hours of use per day are fixed. But with a flow production function and utilization explicitly variable, the error is no longer innocent. With a constant daily "owner cost" of capital, the price per machine-hour of capital services must vary (inversely) with utilization. Consider two identical machines bought at the same time, at the same price and under the same interest rate. Machine 1 is bought to be operated one glorious hour every year. Machine 2 is bought to be operated flat out, 8760 hours every year. Machine One provides one machine-hour of capital services per year. Machine Two provides 8760 times as much. Clearly the price per machine-hour must be very different for the two machines. The price of capital services must be inversely related to utilization ; the daily or yearly owner cost of capital is not.

The inverse relationship between the capital service price and utilization rests on the fact that the capital stock is owned by the firm through periods of utilization and idleness so capital costs are incurred no matter how much or little it is used. The same relationship would hold for labour under slavery, an institution in which the stock of labour, too, is owned by the firm.[4] The cost of owning a slave (labour stock) would depend on his supply price, costs of maintenance-depreciation(-appreciation) and the rate of interest. The price per man-hour (the wage rate) would vary inversely with the man-hours of labour service (flow) the

---

[4] Or, going the other way, capital and labour would be treated symmetrically if capital were rented only for the time it was in use. This happens, of course, for some types of capital equipment, notably computers.

slave provided. The slave's wage rate, like the price of capital service flow, would be a decreasing function of the rate of his utilization.[5]

So the cost per day of owning a unit of capital stock depends on the purchase price of a (standardized) machine, $\bar{P}_m$, on the interest rate, r, and on the rate of economic depreciation, d,[6]

$$P_k = \bar{P}_m (r+d).$$

The cost of owning a capital stock of size $\bar{K}$ for a day is $\bar{K}P_k$ -when r and d are daily rates—regardless of how much capital service flow,K, it gives to production. Therefore, P_k can not be the price of capital service flow, K, that is the argument of the production function (1) ; the capital service price, p_k, is the cost of a machine hour of capital services,

$$p_k = \frac{\bar{K}P_k}{K} = \frac{P_k}{u}.$$

When utilization is assumed constant, P_k/u is a simple scalar of p_k.

The prices of capital service and labour service, therefore, both depend on the rate of utilization. As utilization increases, the price per machine-hour of capital service flow falls because the given cost of owning a capital stock is spread over more hours of use ; as utilization increases, the price of labour service rises because cheap daytime hours are exhausted and it is necessary to overcome people's

---

[5] A close modern parallel to slavery is found in space crew work performance where the labour stock is fixed throughout a mission (and has high cost per unit)while the hours of labour services are variable. A major objective of studies of crew work performance has been the reduction of the "hourly wage" by maximizing labour service flow from the given labour stock to spread its (constant) costs over as many hours of work as possible. "(I) t is obvious that the longer the crew could perform, the better (or at least the more economical) the system would be operationally" [7, p. 144].

More down to earth, where wage payments are determined by subsistence or by minimum wage legislation expressed as a daily or monthly wage payment per worker (as in Pakistan), the same incentive operates to reduce hourly wage rates by increasing hours of work per worker per day or month. Admonitions to firms to reduce average hours of work to increase employment and equity of income distribution encounters clear economic incentives to the contrary [21].

[6] For simplicity, depreciation is assumed throughout to be independent of utilization. The model does not depend on this. It is entirely compatiable with those utilization models that depend solely on depreciation due to use for less-than-maximum utilization [3, 39]. See the Appendix.

preferences against night-time work. The price of labour is determined by the time of day ; the price of capital service is determined by the amount of use per day.[7]

III.

The outlines of the model should now be clear. In an optimal investment, a firm will build a plant with that combination of size of capital stock and rate of its utilization that is expected to yield the lowest cost of producing a given daily output. With the day divided into two shifts, the firm can produce the desired output, Q_o per day solely on a day shift ; or, with two-shift operation, it can produce some output on day shift, some on night shift so the two shifts' output flows together total Q_o per day.

Since the same daily output is to be made with either alternative, their relative profitabilities will be determined by costs alone. The cost of producing Q_o per day with one shift will be $(P_k/u_1)\,K_{d1} + wL_{d1}$. The cost of producing Q_o per day with two shifts will be $(P_k/u_2)\,(K_{d2} + K_{n2}) + w[L_{d2} + (1 + \beta)\,L_{n2}]$. The number subscripts describe the number of shifts being operated per day (hence the price of capital services) and the latter subscripts describe the time of day (hence the price of labour services).

Within a shift, the only variable influenced by the rate of utilization is the price of capital services, P_k/u, which falls consistently with increasing utilization. So production will take place either with a full day shift ($u_1 = 1/2$) or with two full shifts ($u_2 = 1$) and partial shift operations can be ignored. That means, conveniently, that operation over each of the shifts can be described by a single set of relative prices and only two discrete levels of utilization have to be considered.

---

[7] A production process that operated only on night shift would, therefore, have both high wage cost and high capital costs. So few single shift operations work only the night shift. Exceptions are found where the demand for perishable products or services (movies, bars, prostitution, pizzas) is complementary to leisure patterns (that often derive in turn from the dominant work pattern of the day shift). As shift work becomes more common in a community, the night shift demand pattern of these leisure-complementary services relaxes and more of them are available during the day [25, 44]. These complications may have a bearing on the intensity of preferences for shift work [44], hence the value of β, but they do not otherwise affect this analysis.

A high rate of capital utilization—two-shift operation—will be optimal only if, for a given daily output,

$$2p_kK_{d1}+wL_{d1}>P_k[K_{d2}+K_{n2}]+w[L_{d2}+(1+\beta)L_{n2}]$$

—i. e., if the cost of producing Q_o on two shifts is less than the cost of producing Q_o on one shift. Rearranging this, a high rate of capital utilization generally will be optimal if capital costs are lowered with two-shift operation more than labour costs are increased,

$$2P_k[K_{d1}-(1/2)(K_{d2}+K_{n2})]>w[L_{d2}+(1+\beta)L_{n2}-L_{d1}].$$

With two-shift operation, all of the capital will be operated all of each shift—under our assumption of homogeneity of capital, it would never pay to plan to leave part of the capital stock idle—so the flow of capital services will be the same during both shifts, $K_{d2}=K_{n2}=K_2$ and

$$2P_k[K_1-K_2]>w[L_{d2}+(1+\beta)L_{n2}-L_{d1}].$$

Finally, assuming that with two-shift operation the same size crew must be used on both day and night shifts—but that crew size can be changed, *ex ante*—$L_{d2}=L_{n2}=L_2$ and the conditions for profitable two-shift operation become

$$(3) \quad 2P_k[K_1-K_2]>w[2(1+\beta/2)\,L_2-L_1].$$

Under these assumptions, we can drop the subscripts that identify the time of day.

Fixing labour service flows to be the same on both shifts of two-shift operation is consistent with the assumption that *ex post* elasticities of factor service substitution —describing the factor service flow response to changing factor prices after the plant has been built—will be zero while the *ex ante* flow elasticities—before a specific plant has been selected—are greater than zero.[8]

---

[8] This is not the same thing as the familiar putty-clay assumption of zero *ex post* and non-zero *ex ante* elasticities of neoclassical growth theory in Solow, Johansen, etc. [18, 30]. Here we are using pure factor service flow elasticities of substitution. There are elasticities of substitution between capital stock and labour. When utilization is variable in response to changes in relative factor prices, their zero *ex post* stock elasticity—their clay phase—appears conceptually ambiguous, even when *ex post* flow elasticities are zero [46]. See Parts V and VI below.

It should be kept in mind that we are analysing an investment decision. The temptation is strong to think of capital utilization in a *scenario* of (1) producing some output during the day, then (2) considering night-time production of additional output (with "zero marginal capital costs"). But this familiar sequence is a conceptual *cul-de-sac* when applied to an investment decision and it has obscured the reasons why capital is intentionally idle so much of the time. It is misleading on two counts. First, *ex ante*, night costs are not marginal with respect to factor flows and output. (They are marginal with respect to utilization or daily duration of production—but that fact leads to a more, not a less, complicated and unfamiliar analysis of costs and production.) All the familiar marginal conditions with respect to factor flows and output are satisfied throughout this model as factor flows are optimally combined both on one-shift and on two-shift operation. Second, this analysis deals with an optimal investment decision, not the use of an existing capital stock. So the (projected, contemplated, future) extra costs of using as-yet-unpurchased capital at night is not zero. It is negative. To produce the desired daily output a smaller stock of capital will be needed if capital is to be used at night so the daily cost of capital will fall with two-shift (hence night) operation. This is captured formally in the utilization-sensitive price of capital service flow. Of course other costs rise (in this model, labour). Which is why idleness of capital may well be optimal.

IV.

A more explicit model of the interactions among variables in (3) is needed to see what really determines optimal capital utilization and optimal size of the capital stock. The one-and two-shift levels of factor use that figure prominently in (3) are, themselves, influenced by relative factor prices, by the night shift wage differential and, crucially, by the *ex ante* elasticity of substitution between capital and labour. So in this section, the conditions for high levels of optimal capital utilization described generally by (3) are put in the specific context of a CES production function.

$$(4)\quad Q_i = A\left[\delta K_i^{-\rho} + (1-\delta)L_i^{-\rho}\right]^{-1/\rho} \quad i=1,2$$

describes flows of product and factor services per shift with one-shift and two-shift operation, δ is the CES distribution parameter ; $1/(1+\rho)$ is the elasticity of substitution and equals σ in (5). When the conditions for profitable night shift operation in (3) are satisfied by the CES functions,[9]

$$(5)\quad (1+\beta/2)^{\sigma-1}\left[1-(2^{\sigma-1}-1)\left(\frac{\delta}{1-\delta}\right)^{\sigma}\left(\frac{w}{2P_k}\right)^{\sigma-1}\right] \begin{array}{l} > 1 \text{ for } 0 \leq \sigma < 1 \\ < 1 \text{ for } 1 < \sigma < \infty. \end{array}$$

The optimal level of capital utilization in investment planning depends on the amplitude of the input cost rhythm, β, on relative factor service prices, $w/2P_k$, and on the elasticity of factor service substitution, σ, (given the CES distribution parameter, δ). This is a result of considerable importance. When (5) is satisfied, a smaller capital stock will optimally be used 24 hours a day to produce any given daily output ; when it is not, a larger capital stock will be operated during day shift only.

Of particular interest are those variables in (5) that are influenced by preferences or by government policies or both —the shift differential and relative factor prices—and how they interact with elasticities of substitution to increase or decrease the optimal level of capital utilization.

The night shift wage premium, β, is unambiguous in its effects on utilization, always reducing the profitability of high rates of capital utilization—the partial derivative of (5) with respect to β is negative for $0 \leq \sigma < 1$ and positive for $\sigma > 1$. Given values of the other parameters, $\beta = 0$ yields the maximum possible profitability for two shifts and high utilization will be profitable at all relative factor prices and all elasticities. $\beta = 0$ is the necessary condition for the assured coincidence of optimal utilization and the engineering maximum that is often assumed in production literature [1, 18, 30]. When the labour cost rhythm alone is considered, the size of β is determined by the intensity of people's preferences against working at night, by conditions of labour supply and by labour legislation [14, 20, 37].

---

[9] Derivation of (5) is described in the Appendix.

The effect of relative factor prices on optimal utilization is more complicated because it depends on values of the *ex ante* elasticity of substitution. When the elasticity is less than one, a lower cost of capital, P_k, relative to labour brings a lower optimal rate of capital utilization. This supports the logic of earlier analyses that asserted that entrepreneurs will "waste" capital by leaving it idle when it is cheap [24]. But when the elasticity of substitution is greater than one, a lower relative capital price brings a higher optimal level of utilization. Nothing, therefore, can be said about the influence of relative factor prices on capital utilization without first specifying the relevant elasticity range.

Figure 2 illustrates this. Inequality (5) has been solved for relative factor prices and graphed to show the effect of different factor prices, $w/2P_k$, on the relative profitability of one- and two-shift operation under different elasticities. Curves

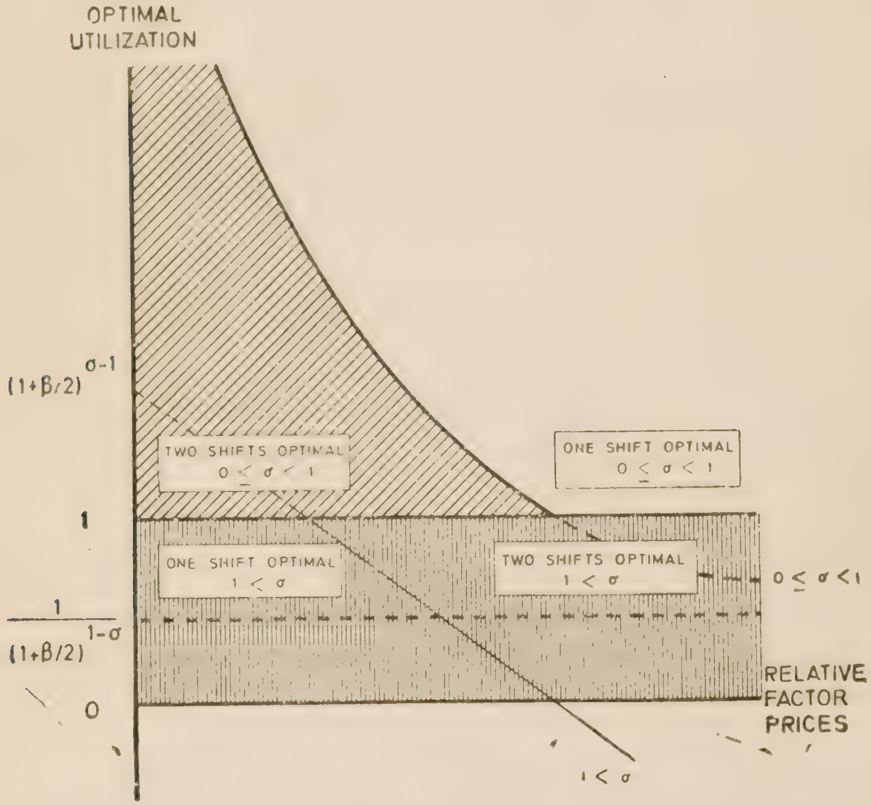


FIGURE 2

have been drawn to represent the three general ranges of elasticity of substitution— $0 \leq \sigma < 1$, $\sigma = 1$ and $\sigma > 1$ (the curve for $\sigma = 1$ is a horizontal line). Comparing any two points on the horizontal axis (any two sets of relative factor prices) the vertical distance between one of these curves and the horizontal line of unit value describes the relative profitability of one- and two-shift operations ; a greater distance (in the shaded direction) describes a relatively more profitable two shift program. However, since the inequalities in (5) go in opposite directions, depending on σ, relative profitabilities of one- and two-shift operations cannot be read the same way for different elasticities. For $0 \leq \sigma < 1$, two-shift operations are shown to be more profitable than one-shift when the curve lies above the line of unit value. The area of relatively profitable two-shift operation is shaded. For $1 < \sigma$, two-shift operations are more profitable than one when the curve lies below the line of unit value. The shaded area again describes a profitable two-shift operation, but the shading is below the unit value line. When the curve crosses or coincides with the line of unit value, both alternatives are equally profitable.

For elasticities of substitution between zero and one the graph shows that two-shift operation is very much more profitable than one shift at low relative wage rates but that advantage declines as the wage increases relative to capital price—the curve is infinite at very low wage rates, w (or high capital prices), then falls asymptotically to $(1+\beta/2)^{1-\sigma}$ as the wage rate increases or the price of capital falls. For low elasticities, 'profitable two-shift operation is described by that part of the curve that lies above the line of unit value. If the night shift wage premium is zero, two shifts will always be at least as profitable as one since the curve approaches the unit value asymptotically from above. But for any non-zero night shift wage premium and any elasticity less than one, there will be some wage rate sufficiently high or capital price sufficiently low to make a high rate of capital utilization unprofitable.

Algebraically, the critical level of relative factor prices that determines the profitability of high or low utilization is

$$(6) \quad \left(\frac{w}{2P_k}\right)^* = \left[\frac{(1+\beta/2)^{\sigma-1} - 1}{(1+\beta/2)^{\sigma-1}\,(\delta/(1-\delta))^{\sigma}(2^{\sigma-1}-1)}\right]^{1/(\sigma-1)}.$$

For elasticities of substitution less than one, high levels of capital utilization and a small capital stock will be profitable if relative factor prices are less than this critical value. With relative factor prices greater than this critical value, (a higher wage rate or lower price of capital), single shift operation of a larger capital stock will be most profitable.

The special case of zero *ex ante* elasticity of substitution is interesting, both because it is a limiting case and because it is (too) often assumed to describe much actual production in less developed countries. With $\sigma=0$ in (5), two shifts will be profitable so long as $2P_k/w > \beta$. Something is lost, however, in using a CES production function to describe fixed coefficient production. Alternatively, holding factor proportions constant in (3) yields $\frac{2P_k}{w} \; \frac{K}{L} > \beta$ as the condition for profitable night shift operation. This is better in reflecting the influence of the level of factor proportions—of where fixed factor proportions are fixed—or, more generally, the influence of factor shares relative to the shift differential.

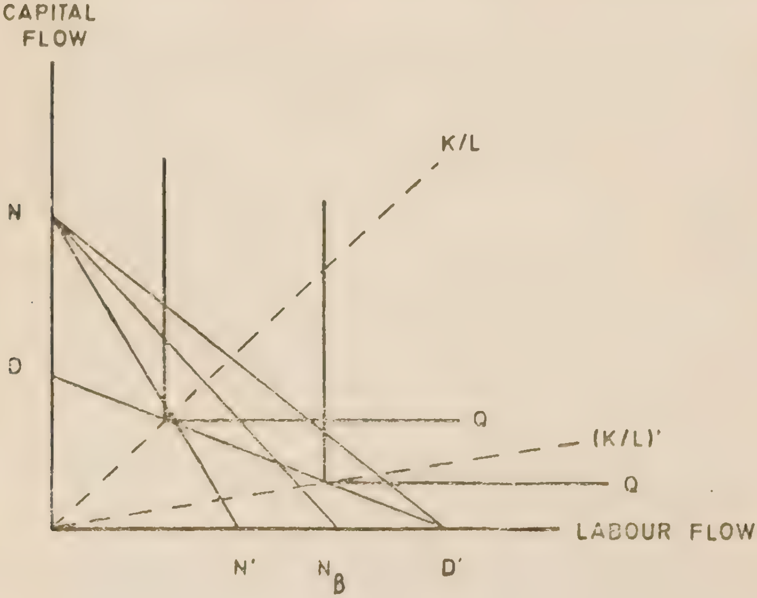


FIGURE 3

With a given set of one shift DD′ and two-shift ND′ and NN′ (averaged by NN_β) isocost curves representing the same total costs, a capital intensive technique, K/L, will lead to profitable two-shift operation while a labour intensive technique, (K/L)′, will not.

Unitary elasticity of substitution divides the two ranges of elasticity but it has significance considerably beyond that. The curve for $\sigma=1$ in Figure 2 is a horizontal line, indicating that the difference between one- and two-shift profitability does not depend on relative factor prices; equation (6) does not have a limit for $\sigma=1$. This result is probably more significant for economic theory than for economic behaviour because Cobb-Douglas is the explicit production function economists to have used in examining capital utilization [10, 27], yet it is the one special case of the CES that yields no understanding of the crucial influence of factor prices on optimal utilization. This seems likely to have considerably obscured the theoretical analysis—and even the issue—of variable, planned capital utilization.

If a Cobb-Douglas function,

$$Q_i = A \quad K_i^{\alpha} \quad L_i^{1-\alpha} \qquad i=1,\ 2,$$

were used in place of the CES function (4), the necessary condition for optimal two-shift operation (5) would be simply

$$(5') \quad \beta<2(2^{\alpha/(1-\alpha)}-1).$$

The amplitude of the cost rhythm and relative shares enter, but factor prices drop out. For $\alpha=1/3$, two-shift operation will be optimal for any $\beta<84\%$—a figure more than twice the values observed for β as a night shift wage differential. A larger capital's share, α, relaxes the restriction on β still further.

When elasticities of factor service substitution are greater than one, the influence of relative factor prices on optimal utilization becomes perverse—higher wages (lower capital price) induce high rate of utilization. In Figure 2 the curve for $\sigma > 1$ is downward sloping from a vertical intercept at $(1+\beta/2)^{\sigma-1}$ to negative infinity at very high relative factor prices.[10] With a high elasticity, the con-

---

[10] Actually, the curve for $\sigma > 1$ is concave upward for $1 < 2\ \sigma < 2$ and concave downward for $2 < \sigma$. It is linear only at $\sigma = 2$.

dition for more profitable two-shift operation is that the curve lie below 1, so Figure 2 shows that increasing the wage rate relative to capital price will increase the relative profitability of two-shift operation. With no night wage premium, of course, β is zero and all relative factor prices will induce two-shift operation. As β increases, so does the minimum level of relative wage needed to induce high utilization. As can be seen, too, in (6) a relative wage less (capital price more) than this critical value will yield single-shift operation ; a relative wage greater than the critical value will yield two-shift operation.

The appealing logic of 'waste what is relatively cheap' appears to break down as the cause of idle capital in the case of high elasticities of substitution. The explanation for this surprising result lies in the two different ways relative factor prices influence optimal utilization. They are :

1. Given factor service proportions, relative factor prices determine factor shares—the weights of capital and labour in total costs—therefore by how much total costs will be reduced (increased) when relative factor prices change between one- and two-shift operation. If the wage bill is a large proportion of one-shift total cost, any given night wage premium, β, will (when comparing one- and two-shift costs) imply a large increase in total costs. Complementing this, the saving from the reduced two-shift capital price will be smaller. The night wage increase works on a large part of total costs ; the capital price reduction works on a small part of total costs. This is what Figure 3 describes for the especially simple case of $\sigma=0$.

2. But to the extent that *ex ante* elasticity of substitution allows it, factor proportions will themselves be affected by relative factor prices; factor service proportions are not given if substitution is possible. With substitution, changing relative factor prices will affect factor shares positively when the elasticity of substitution is less than one. A higher relative wage will increase labour's share and, in the logic of the preceding paragraph, this in turn will make two-shift operation relatively less profitable. So for low elasticities, an increased relative wage (lower capital price) reduces the optimal level of utilization.

But when the elasticity of substitution is greater than one, changing relative factor prices will affect factor shares negatively. A higher relative wage will induce so much substitution out of labour use that the share of labour in total costs will fall. Then at that point, the logic of paragraph 1 above takes hold again – that labour's share and the profitability of two-shift operation are negatively associated. But, for higher elasticities it means that an increased relative wage increases optimal utilization by reducing labour's share.

V.

Here the results of Part IV are used to examine the amount of employment generated per unit of capital stock or investment, as a function of its utilization. There are two employment relationships corresponding to two separate policy questions : (A) the employment implications of increased (decreased) capital utilization, *per se*, from changing preferences, β, or industrial characteristics, δ or σ, and (B) the total employment effect of a change in relative factor prices that both (1) induces increased employment from two-shift operation and (2) changes the optimal factor proportions on even one-shift operation.

The number of workers employed, $\bar{L}$, is a simple function of man-hours of labour service flow, L, when the average work-day per worker (the flow-stock relationship for the labour factor) is held constant. A twelve hour (one-shift) day for each employee fits the present analysis most simply, but any arbitrary constant would do. The shorter the average day, of course, the greater the number of people employed, $\bar{L}$, given the man-hours of labour being used.

A. Employment and Utilization, *Per Se*

The most useful way to describe the impact of utilization, *per se*, on employment is in the number of workers optimally used with a unit of capital stock (investment) with high or low utilization. This is the comparison, relevant to new investment or to describe what-would-have-been the level of employment if two-shift operation had been optimal when an existing capital stock initially was installed. It is clearly the measure to be used by a planner to determine the employment that will be generated with limited investment funds.

Relative factor services prices must equal the ratio of their marginal products so optimal factor service proportions in a CES production function (4), will be

$$K_1/L_1 = \left(\frac{w}{2P_k} \quad \frac{\delta}{1-\delta} \right)^{\sigma}$$

on one-shift operation and

$$K_2/L_2=\left(\frac{(1+\beta/2)w}{P_k}\ \frac{\delta}{1-\delta}\right)^{\sigma}$$

on two-shift operation. Combining these,

$$(7)\quad \frac{L_2/K_2}{L_1/K_1}=\frac{1}{(2+\beta)\sigma}$$

describes the man-hours of labour service used per machine hour of capital service with two-shift operation relative to one-shift operation. The maximum value (7) can take is one. Only when elasticity of substitution is zero will it equal one since factor service proportions must then be the same regardless of utilization. With $\sigma > 0$, the higher wage and lower capital service price of two-shift operation will induce substitution out of labour service and into capital services and (7) will lie between 0 and 1. Even if $\beta=0$, there would be substitution out of labour use with two-shift operation because of the fall in capital service price, despite the assumed constancy of labour service price.

Using the explicit relationships between capital stock, $\overline{K}$, daily capital service flow, K, and utilization, u, from equation (2), $K=u\overline{K}$ when $a=1$. Then the daily flow of capital services, K_1, on one-shift operation is related to the stock of capital, $\overline{K}_1$, needed with one-shift operation by $K_1=(1/2)\,\overline{K}_1$. The daily flow of capital services on two-shift operation, $2K_2$, is related to the capital stock necessary for two-shift operation, K_2, by $2K_2=\overline{K}_2$. Therefore, on one-shift operation, the optimal man-hours of labour service per unit of capital stock, L_1/K_1, is

$$L_1/\overline{K}_1=(1/2)\ L_1/K_1$$

where L_1/K_1 are optimal flow proportions. On two-shift operation, the relationship is simply,

$$L_2/\overline{K}_2=L_2/K_2\,.$$

With any given average work-day, then,

$$(8)\quad \frac{L_2/\overline{K}_2}{L_1/\overline{K}_1}=\frac{\overline{L}_2/\overline{K}_2}{\overline{L}_1/\overline{K}_1}=2\ \frac{L_2/K_2}{L_1/K_1}=\frac{2}{(2+\beta)\sigma}$$

describes the number of workers employed, L, per unit of capital stock (machine) with two-shift operation relative to one- shift operation. The relative amount of employment generated by the two levels of utilization depends only on the *ex ante* elasticity of factor (service) substitution, σ, and on the size of the night shift wage premium, β. A smaller elasticity of substitution or a smaller night shift wage premium will always increase the employment gain from a higher level of capital utilization.

The maximum value (8) can take is two with $\sigma = 0$. When there is no opportunity to vary factor flow proportions, doubling the period of utilization of the capital stock will double the necessary man-hours of labour service input. If the elasticity of substitution lies between zero and one, utilization of the capital stock will double with a less than double input of labour services. There will be some increase in labour use per unit of capital stock with two-shift operation, however, so long as (8) is greater than one (which requires for $\sigma < 1$, that $2^{1/\sigma} - 2 > \beta$).[11] For example, consider $\sigma = 0.5$ and $\beta = .25$. Then the value of (7) will be 67%—two-shift relative factor service proportions will be a third less than those for one-shift. But the value of (8) will be 133%—employment per unit of capital stock for two shifts will be a third greater than employment per unit capital stock for a single shift.

The result described by (8) deserves several additional comments.

1. The employment that can be created by high levels of capital utilization appears potentially to be very large. In Table I, equation (8) is evaluated—expressed as proportional change—for a number of illustrative combinations of night-wage premia, β, and elasticity of substitution, σ—different incentives to (β),

---

[11] If the elasticity of substitution were greater than one or if β were too large ($\beta > 2.0$ for $\sigma = 1/2$; $\beta > .16$ for $\sigma = .9$) (8) would be less than one—less employment per unit of capital stock would be required despite two-shift operation. The higher wage rate and lower capital price of two shifts would induce so much substitution out of labour services and into capital services (so small a value of (7), that two-shift operation would require a larger capital stock per worker despite doubled utilization. This possibility—β very large or $\sigma > 1$—appears unlikely.

and opportunities for, (σ), factor substitution with two-shift operation.[12] There are no entries for $\beta = 0$ since one-shift operation could never, in the strict context of this two-factor model, be optimal without a night wage premium. Even the lower values in Table I describe significant increases in employment.

TABLE I

PERCENT EMPLOYMENT EXPANSION WITH INCREASED UTILIZATION*

Night Shift Wage Premium	Elasticity of Factor Service Substitution					
β	σ					
	0	0.25	0.50	0.75	1.0	1.25
0.05	100%	67%	40%	17%	—2%	—18%
0.10	100	66	38	15	—5	—21
0.25	100	63	33	9	—11	—27
0.35	100	62	30	5	—15	—31
0.50	100	59	27	1	—20	—36

*From one to two twelve-hour shifts.

Because this information has a good deal of relevance for actual employment policies, note that the increase in employment per unit of investment in moving from one to three eight-hour shifts per day (with the same β on both of the night shifts) can be read by doubling each entry in Table I. Then the maximum increase in employment through increased utilization *per se* is 200% and a moderate increase is in the order of 100%. Table I can be read,

---

[12] Empirically, night shift wage premia, β, vary from 0 to .50 though .10 to .30 is typical of advanced countries [41]. There are no empirical estimates of the elasticity of factor service substitution, σ, though what little descriptive information I've found implies values between 0 and 1 [32]—values that have been shown to be consistent with empirical stock elasticities greater than one [46].

alternatively, as a measure of the lost employment now built into a capital stock by past failure to get high levels of capital utilization. This appears to be of considerable practical importance to less developed countries [42, 45]. We will return to this in the next section.

2. The employment impact of two-shift operation is at a maximum when the *ex ante* elasticity of substitution equals zero. This, significantly, means that the increase in employment induced by second-shift operation is greatest under those circumstances of technical non-substitutability of factor services that are often supposed to deny the variability of factor proportions. This interesting conclusion is reinforced by the fact that throughout the analysis we have assumed a zero *ex post* elasticity of substitution—no variability of factor service proportions after construction of the capital stock.

3. The elasticities of substitution, σ, in this analysis are factor service flow elasticities for a single process. The low values that yield a large employment impact with increased utilization shown in Table I are compatible with empirical aggregated elasticity estimates based on capital stock though these have usually been found to be greater than one [5, 8, 27]. Empirical investigation of factor service flow elasticities is clearly called for, but in the meantime, existing stock estimates are consistent with low values of σ, hence a higher employment impact of two-shift operation [46].

B. Employment Induced by Factor Service Prices

A major implication of the analysis of Part IV is that changes in factor service prices can induce two-shift operation. But if factor prices change to make higher utilization optimal, they will at the same time change optimal one-shift employment per unit capital stock and the net employment effect of the factor price change cannot be read simply from equation (8) ; its denominator, too, will be changed.

Consider optimal one-shift operation at relative factor prices, $R\ (=w/2P_k)$, and employment per unit of capital stock of $\overline{L}_1/\overline{K}_1$. Then, alternatively, consider a proportionally different, $\dot{R}$, set of factor prices just sufficient to make two-shift operation optimal with employment per unit capital stock of $\overline{L}_2/\overline{K}_2$. The total proportional difference in employment per unit capital stock resulting from the different prices will be[13]

$$(9)\quad \frac{d(\bar{L}/\bar{K})}{\bar{L}_1/\bar{K}_1} = \left[\frac{2}{(2+\beta)\sigma} - 1\right] - \sigma\dot{R}\left[\frac{2}{(2+\beta)\sigma} - 1\right].$$

The first term is from equation (8), expressing the employment difference between one- and two-shift operation proportionally. The second term is the same proportional difference but applied to the price induced change in one-shift employment. Their sum describes the total employment impact of a factor price induced change in utilization.

Part IV showed that to induce two-shift operation, $\dot{R}$ will be negative for $\sigma < 1$ and positive for $\sigma > 1$. So for low elasticities of substitution, lower wages (higher

---

[13] If R changes the denominator of (8) to $L'_1/\bar{K}'_1$, then (8) alone describes

$$\frac{\bar{L}_2/\bar{K}_2}{\bar{L}'_1/\bar{K}'_1} = \frac{2}{(2+\beta)\sigma}$$

and the proportional difference in employment per unit capital stock from increased utilization *per se* will be

$$\frac{d_2}{\bar{L}'_1/\bar{K}'_1} = \frac{\bar{L}_2/\bar{K}_2}{\bar{L}'_1/\bar{K}'_1} - 1 = \frac{2}{(2+\beta)\sigma} - 1$$

where $d_2 = \bar{L}_2/\bar{K}_2 - \bar{L}'_1/\bar{K}'_1$. The proportional change in optimal employment per unit capital stock on one-shift operation is

$$\frac{d_1}{\bar{L}_1/\bar{K}_1} = \frac{\bar{L}'_1/\bar{K}'_1}{L/K} - 1$$
$$= -\sigma\dot{R}$$

from the definition of elasticity of flow substitution when $d_1 = \bar{L}_1/\bar{K}_1 - \bar{L}'_1/\bar{K}'_1$. Then,

$$\frac{d_2}{\bar{L}'_1/\bar{K}'_1} = \frac{d_2}{\bar{L}_1/\bar{K}_1} \cdot \frac{\bar{L}_1/\bar{K}_1}{\bar{L}'_1/\bar{K}'_1} = \frac{2}{(2+\beta)\sigma} - 1$$

So $$\frac{d_2}{\bar{L}_1/\bar{K}_1} = \left[\frac{2}{(2+\beta)\sigma} - 1\right]\frac{\bar{L}'_1/\bar{K}'_1}{\bar{L}_1/\bar{K}_1}.$$

Since $(\bar{L}'_1/\bar{K}'_1)/(\bar{L}_1/\bar{K}_1) = 1 - \sigma\dot{R}$,

$$\frac{d_2}{\bar{L}_1/\bar{K}_1} = \left[1 - \sigma\dot{R}\right]\left[\frac{2}{(2+\beta)\sigma} - 1\right]$$

includes both the employment effects of the differences in factor prices.

capital price) induce two-shift operation and factor substitution increases employment per unit capital stock on one-shift operation, increasing the denominator of (8) thus reinforcing the positive employment effect of higher utilization. But for high elasticities, higher wages (lower capital price) induce two-shift operation so factor substitution reduces employment per unit capital stock on one-shift operation, reducing the denominator of (8) and counteracting, in part at least, the positive employment effect of higher utilization.

This is clearer in Table II where (9) has been evaluated for a fifty percent change in relative factor prices ($\dot{R} = \pm .5$) and again for a plausible range of shift premia, β, and elasticities of substitution, σ.

The influence of elasticity of substitution is clear in Table II. For elasticities less than one, the increase in one-shift employment contributes significantly to employment creation of induced higher utilization. At an elasticity of .5 and a shift wage premium of 25%, for instance, employment per unit of capital stock would increase by 42% about a fourth of which is due to increased one-shift

TABLE II

PERCENT EMPLOYMENT EXPANSION INDUCED BY FACTOR PRICES*

Night Shift Wage Premium	Elasticity of Factor Service Substitution				
β	σ				
	0	0.25	0.50	0.75	1.25
0.05	100%	76%	50%	23%	— 7%
0.10	100	74	48	20	— 8
0.25	100	71	42	12	—10
0.35	100	69	38	7	--12
0.50	100	66	33	1	—14

*From one to two twelve-hour shifts.

employment. It is significant that the employment effect is generally greater for lower elasticities. For elasticities greater than one, the negative influence of one-shift employment reduction is dramatic, more than cancelling any increase in employment from two-shift operation. In the other dimension, the entries of Table II show that the larger is the amplitude of the cost rhythm—the larger is β—the less will high utilization increased employment per unit capital stock.

Though it is dangerous to use a two-factor one-rhythm model too literally in explaining a concrete case with many factors and rhythms.[14] it appears that industrial employment in Pakistan would probably now be a good deal higher had the government not followed import substitution policies that lowered capital price (*vis a vis* all inputs) and raised wage rates. The prices actually paid by Pakistani industrialists misrepresented factor scarcities ; minimum wage laws raised industrial wages, w, capital import an exchange policies reduced the price of imported capital equipment, P_m by as much as 54% [35] and banking policies encouraged insider borrowing by industrialists at low privileged interest rates, r. The effect of these policies on the factor prices that guided industrial investment decisions can only be guessed at but a conservative guess might put actual private relative factor prices $w\ 2P_k$, fifty to one hundred percent above their scarcity value. Since use of actual scarcity prices would probably have induced widespread second shift operation (assuming $\sigma < 1$), Table II suggests that the loss of industrial employment caused by these policies might amount to as much as 75% of existing industrial employment (with $.25 \leq \sigma \leq .75$ and $0.5 \leq \beta \leq .25$). If so, the negative impact of these policies has been (and continues to be) considerable.

VI.

The productivity of investment—output per unit capital stock—clearly changes with the utilization of the capital stock. With variable utilization, a constant

---

[14] Explicit shift differential wage rates are rarely paid to industrial labour (in the usual sense) in Pakistan because high levels of unemployment prevent workers' expressing their preferences for day work—though they powerfully express them in interviews. But there is a very pronounced management-supervisory aversion to night work that acts, in a two-factor model, to increase night "labour" costs. And other input cost rhythms appear to have larger amplitudes in poor than in advanced countries where organized institutions of inventories and forward markets tend to smooth out especially seasonal cost rhythms.

"capital-output ratio" in the usual sense is most unlikely. In this section, we will use the results of Part IV to examine the relative productivity of the capital stock with high and low utilization, *per se*, and the further question—similar to that discussed above—of the change in capital stock productivity when increased utilization is induced by a change in factor prices.

A. The Productivity of Capital Stock, *Per Se*

The output per machine hour of capital services on one-shift operation is

$$Q_o/K_1 = A\left[\delta + (1-\delta)(R/\triangle)^{1-\sigma}\right]^{\sigma/(\sigma-1)}$$

where $R = w/2P_k$ is relative factor prices and $\triangle = \delta/(1-\delta)$ is relative shares. So the productivity of the capital stock, $\bar{K}_1$, with one-shift operation will be

$$Q_o/\bar{K}_1 = (A/2)\left[\delta + (1-\delta)(R/\triangle)^{1-\sigma}\right]^{\sigma/(\sigma-1)}$$

since $u = 1/2$ in (2). For two-shift operation, the same sort of relationships hold, though output on each of the two shifts will be only $(1/2)Q_o$. Putting these together, the relative productivity of capital stock between two- and one-shift operation will be

$$(10) \quad \frac{Q_o/\bar{K}_2}{Q_o/\bar{K}_1} = 2\left[\frac{1 + R^{1-\sigma}\triangle^{2-\sigma}}{1 + (2BR)^{1-\sigma}\triangle^{2-\sigma}}\right]^{\sigma/(1-\sigma)}$$

where $B = (1 + \beta/2)$ is the proportional increase in two-shift wage rates.

Table III shows the percent by which two-shift capital productivity exceeds one-shift productivity for a range of values of σ and β (with $\delta = 1/3$ and $R = 1.5$) from Williamson's Philippine data [40]. The effect of the elasticity of substitution, σ, on relative capital stock productivity, is clear in Table III. If there is no opportunity for factor service substitution—one- and two-shift operation must use the same factor service proportions despite the higher price of labour on two-shift operation—the increase in capital stock productivity with utilization is maximized. Doubling the use of the capital stock per day doubles its output per day for all night wage premia, β. As the elasticity of substitution increases, so does the

TABLE III

PERCENT INCREASE IN CAPITAL PRODUCTIVITY WITH INCREASED UTILIZATION*

Night Shift Wage Premium	Elasticity of Factor Service Substitution					
β	σ					
	0	0.25	0.50	0.75	1.25	2.0
0.05	100%	88%	77%	67%	49%	26%
0.10	100	87	76	66	47	25
0.25	100	86	74	63	44	21
0.35	100	85	72	61	41	19
0.50	100	84	70	59	38	16

*From one to two twelve-hour shifts.

opportunity to take advantage of relatively lower priced capital services with two-shift operation and avoid the higher priced labour. As more capital services are used on two-shift operation, the relative increase in capital stock productivity with two shift operation declines. With an elasticity of substitution of $\sigma = .50$ and $\beta = .25$, for instance, the output per unit capital stock would be only 74% higher with two-shift operation than with one—doubling utilization of the capital stock significantly increases, but does not double, its productivity.

The night shift wage premium increases the relative wage rate for two-shift operation, so the higher is β, the more will capital services be substitued for labour services on two-shift operation (give any σ) and therefore the less will the productivity of capital stock be increased by doubling its period of operation. It is worth noting, though, that even with extreme values for shift premium and elasticity of substitution, the productivity of the capital stock is still larger with two-shift operation.

B. Capital Productivity and Changing Factor Service Prices

If factor prices are changed to induce two-shift operation, the resulting change in the productivity of capital stock will be more complicated. Equation (10) describes only relative capital stock productivity with two-shift operation, *per se*. But as in the case of employment, a change in factor prices will change the productivity of capital on one-shift operation —the denominator of (10)—at the same time that it induces two-shift operation.

Consider one-shift operation with capital stock productivity of $Q_o\,\bar{K}_1$ and initial relative factor prices of R. If a proportional difference in factor prices, $\dot{R}$, is just sufficient to induce two-shift operation with capital stock productivity of $Q_o/\bar{K}_2$, the total proportional change in capital productivity will be

$$(11)\quad \frac{d(Q/\bar{K}_1)}{Q_o/\bar{K}_1} = (2T-1) - \sigma\dot{R}\left[\frac{R^{1-\sigma}\Delta^{-\sigma}}{1+(R\Delta)^{1-\sigma}}\right](2T-1)$$

where $$T = \left[\frac{1+R^{1-\sigma}\Delta^{2-\sigma}}{1+(2BR)^{1-\sigma}\Delta^{2-\sigma}}\right]^{\sigma/(1-\sigma)}.$$

The first term in (11), from equation (10), describes the proportional increase in capital productivity from increased utilization, *per se*. The second term describes the same proportional difference, but applied to the price-induced increase (decrease) in productivity on one-shift.[15]

In Table IV, (11) is evaluated at $\delta = 1.3$, $R = 1.5$, $\dot{R} = \pm .5$ for a range of values of elasticity of substitution, σ, and shift wage differential, β. When factor prices change, inducing increased utilization, factor substitution reenforces the increase in capital stock productivity for $\sigma < 1$ —lower relative wage rates (higher capital prices) increase the denominator of (10) while inducing higher utilization. So, in the example used before, for an elasticity of .5 and a shift wage premium of .25, the increase in capital productivity with two-shift operation is—16 percentage points of which come from increased capital productivity due to factor substitution on one-shift operation.

---

[15] Derivation of (11) is analogous to equation (9) described in footnote 13.

TABLE IV

PERCENT INCREASE IN CAPITAL PRODUCTIVITY INDUCED BY FACTOR PRICES*

Night Shift Wage Premium	Elasticity of Factor Service Substitution					
β	σ					
	0	0.25	0.50	0.75	1.25	2.0
0.05	100%	98%	95%	91%	17%	—4%
0.10	100	97	94	89	16	—4
0.25	100	96	91	85	15	—3
0.35	100	95	89	83	14	—3
0.50	100	93	86	79	13	—2

*From one to two twelve-hour shifts.

What is most significant in the results summarized in Table IV—both for economic development and production theory—is that the productivity of the capital stock varies with varying factor prices even when the elasticity of substitution between factor services is zero—even when "a machine...must be operated by a crew of fixed size" [37, p. 207]. So for all β, $\sigma = 0$ doubles the productivity of a capital stock with two-shift operation. At higher elasticities, the increase in capital stock productivity is not so large.[16]

---

[16] When dealing with a change in utilization induced by a factor price change, the size of the necessary factor price change, R, clearly makes a difference to both employment and output per unit capital stock—equations (9) and (11); Tables II and IV. The change in employment or output due to increased utilization, *per se*—equations (8) and (10)—is always at a maximum when $\sigma = 0$. But the other, substitution, component of a price-induced change in employment or output is zero at $\sigma = 0$ and increases with increasing σ. So for large price changes, R, these two effects together—the evaluation of (9) and (11)—may reach a maximum at $\sigma > 0$. Yet it remains true that the increase due to utilization, *per se*, is at a maximum when $\sigma = 0$.

With the same caveats and estimates as in Part V, the sense of Table IV can be illustrated by the experience of Pakistan industrialization. The implication is that the productivity of their industrial investment—the "incremental output-capital ratio"—would have been as much as 98% higher had more realistic factor prices been used, inducing increased utilization of their capital stock. Since utilization of industrial capital in Pakistan is in the order of 15%, there was scope for improved capital stock productivity through increased utilization.

It is difficult to give meaning to the concept of "fixed investment coefficients" when it describes capital stocks in either economic development or growth theory in light of these results. So long as utilization is less than its engineering maximum, the productivity of capital stock (investment) must vary with change in utilization and changes in utilization can be induced, in turn, by changes in relative factor prices. Recognition of variable utilization introduces an additional (highly neo-classical) mechanism for variations in capital-stock-labour and capital-stock-output relationships in response to relative factor prices.

VII.

I have stressed that this analysis deals with capital utilization as part of a long run investment decision, not with the problem of adjustment of utilization with a given capital stock. This short run question, however, is of considerable interest so in this part we will look briefly at an unexpected expansion of demand with a given capital stock (the familiar Keynesian context, rather than this one, is appropriate to handle unexpected reduction in demand).

Consider a plant producing a daily output of $Q_0 = F(K_1, L_1)$, operating a single shift (because it was optimal at the time of investment). Production function and flows are as defined before but now the relevant elasticity of factor service substitution is *ex post*, σ. If that plant (=firm) is faced, *cet. par.*, with a demand for 2Q of daily output, it has two options: (I.) increase utilization of the existing plant or (II.) expand the capital stock to be operated a single shift. If we deal with the case of $\sigma = 0$, the issue can be developed simply since $2Q_0 = F(2K_1, 2L_1)$ and the problem is how most cheaply to double the factor service flows. The two alternatives are, (I.) carries no additional capital cost but two-shift operation increases labour costs. (II.) avoids the increased labour costs by duplicating daytime operation, but it thereby incurs the full cost of K_1 of additional capital service.

	Ways to Double Factor Service Flows		Costs of an Additional Q_o of Output	
	Capital	Labour	Capital	Labour
I. Increase Utilization of Existing Capital	$2K_1 = (2u)\bar{K}_1$	$2L_2$	0	$(1+\beta)wL_2$
II. Expand the Capital Stock	$2K_1 = u(2\bar{K}_1)$	$2L_1$	$2P_kK_1 = P_m(r+d)\bar{K}_1$	wL_1

Doubling output by increasing utilization (I.) will be less costly than doubling output through expansion of the capital stock (II.) if

$$\beta < \frac{2P_k}{w} \frac{K}{L}$$

which is familiar from the earlier analysis when $\sigma = 0$. Increased utilization of existing capital will most likely be the cheapest way to double output the smaller is the night wage premium, β, and the larger is the (fixed) capital labour service ratio, K/L, or the smaller is the wage rate relative to capital price, $w/2P_k$ —i. e., the larger is capital's relative share.

This is for $\hat{\sigma} = 0$. Over $0 < \hat{\sigma} < 1$, the same influences will operate, but the relative cost advantage of increased capital utilization will increase with increasing elasticities since they allow two-shift operation with substitution out of expensive labour services and into free capital services. It is significant that even when additional capital service flow can be had in the short run without cost through increased utilization—because the capital cost is 'sunk' and the stock has to be owned through the night to be used the next day – it will not always be profitable to increase utilization as the way of expanding output. This answers Eisner's question, 'Indeed (if increased utilization and capital stock additions contribute equally to output) one might wonder why firms ever did alter their capital stock. It would appear that one could do just as well by utilizing existing capital more intensively, and think of the money one would save' [10, p. 473]. Whether or not one would save all that money depends, of course, on the time-sensitive costs of complementary inputs, not on a qualitative difference in increased capital service flow according to its source in changed utilization or changed capital stock.

VIII.

When input costs vary rhythmically, the level of optimal capital utilization in investment is an economic variable, responsive to changes in relative factor prices. When this is recognized, a range of theoretical and practical issues can be better understood, especially those that depend for their validity on long run capital-stock-output or capital-stock-labour relationships that are assumed stable while relative factor prices change. This includes much of the aggregate growth and development analysis of the past decade and a half [15, 36].

However, the motive for developing this model initially was more pragmatic—to understand the low levels of capital utilization observed in capital-poor underdeveloped countries. Its implications for this question seem to be significant. The most popular capitalist development policies [4, 31] appear actively to have discouraged output and employment growth while promoting the idleness of (especially imported) capital. Under import-substitution policies with assumed absorbtive capacity limits the effective price of capital service has been made very low while'social' legislation has increased the wage rate of those employed [34] respect for managerial preferences has typically been encouraged in the spirit of a free market and little has been done to damp seasonal cost rhythms of other inputs. Even where factor price distortions have not been compounded by corruption induced by artificial exchange rates [42], it seems likely that the very low levels of observed industrial capital utilization and employment growth in less developed countries are due in significant part to incentives created by these development strategies.

REFERENCES

1. Arrow, Kenneth J., "The Economic Implications of Learning by Doing," *Review of Economic Studies,* Vol. XXIX (3), 94 (1966), 117-192.

2. Bain, Joe S., *Price Theory*, (New York: John Wiley and Sons, Inc., 1967).

3. Brito, D. L., and Williamson, Jeffrey G., "Heterogeneous Labor Inputs and Nineteenth Century Anglo-American Managerial Behavior," Social Systems Research Institute, Workshop Series, EDIE 7104, University of Wisconsin, Madison, Wisconsin, April 1971.

4. Bruton, Henry J., "The Import-Substitution Strategy of Economic Development : A Survey," *The Pakistan Development Review* (Summer 1970), 123-146.

5. ————, "The Elasticity of Substitution in Developing Countries," Williams College Research Memorandum No. 45, Williamstown, Mass., (April 1972).

6. Chenery, Hollis B., "Overcapacity and the Acceleration Principle, " *Econometrica*, Vol. 20, No. 1, (January 1952), 1-28.

7. Chiles, W. Dean, Alluisi, Earl A., and Adams, Oscar S., "Work Schedules and Performance During Confinement," *Human Factors*, 1968, 10(2), 143-196.

8. Daniels, Mark R., "Differences in Efficiency Among Industries in Developing Countries," *American Economic Review*, (March 1969), 159-171.

9. Denison, Edward F., "Some Major Issues in Productivity Analysis: An Examination of Estimates by Jorgenson and Griliches," *Survey of Current Business*, (May 1969), 1-22.

10. Eisner, Robert, "Capital and Labor in Production: Some Direct Estimate," in Brown, Murray, ed., *The Theory and Empirical Analysis of Production.* (Studies in Income and Wealth), Vol. 31, The Conference on Research in Income and Wealth, NBER, (New York: Columbia University Press, 1967).

11. Foss, Murray F., "The Utilization of Capital Equipment: Postwar Compared with Prewar," *Survey of Current Business*, (June 1963), 8-16.

12. Georgescu-Roegen, Nicholas, "The Economics of Production," *The American Economic Review*, Vol. LX, No. 2, (May 1970), 1-9.

13. ————, "Chamberlin's New Economics and the Unit of Production," Ch, 2 in Kuenne, R. E., ed., *Monopolistic Competition Theory: Studies in Impact*, (New York, 1967), 31-62.

14. Great Britain, National Board for Prices and Incomes, *Hours of Work, Overtime and Shiftworking*, Report No. 161, (London: Her Majesty's Stationery Office; December, 1970).

15. Hahn, F. H., and Matthews, R. C. O., "The Theory of Economic Growth: A Survey," *Surveys of Economic Theory, Vol. II. Growth and Development*, (The American Economic Association and the Royal Economic Society), (New York: St. Martin's Press, 1965), 1-125.

16. Hirschman, Albert O., *Development Projects Observed*, (Washington, D. C.: The Brookings Institution, 1967).

17. Hogan, Warren P., "Capacity Creation and Utilization in Pakistan Manufacturing Industry," *Economic Development Report No. 84*, Development Advisory Service, Center for International Affairs, Harvard University, Cambridge, Mass., (September 1967).

18. Johanson, Leif, "Substitution versus Fixed Production Coefficients in the Theory of Economic Growth: A Synthesis," *Econometrica*, Vol. 27, (April 1959).

19. Jorgenson, D. W. and Griliches, Z., "The Explanation of Productivity Change," *The Review of Economic Studies*, Vol. XXXIV (3), No. 99, (July 1967), 250-285.

20. Kim, Young Chin, *Under-utilization of Manufacturing Capacity in Underdeveloped Countries: Its Meaning, Extent, and Possible Implications*, Unpublished Ph. D. Dissertation, Columbia University, 1968.

21. Little, I. M. D., "The Influence of Economic Policies in Less Developed Countries on the Capital Intensity of Investment and Growth of Employ-

ment," Conference on Strategies for Agricultural Development in the 1970's, Stanford University, (December 1971).

22. Lucas, Robert, Jr., "Capacity, Overtime and Empirical Production Functions," *American Economic Review*, Vol. LX, No. 2, (May 1970), 23-27.

23. Manne, Alan S., ed., *Investments for Capacity Expension: Size, Location and Time Phasing*, (London: George Allen and Unwin Ltd., 1967).

24. Marris, Robin, *The Economics of Capital Utilization: A Report on Multiple-shift Work*, (Cambridge: Cambridge University Press, 1964).

25. Mott, Paul E., *et al.*, *Shift Work, the Social, Psychological and Physical Consequences*, (Ann Arbor: The University of Michigan Press, 1965).

26. Nadiri, M. Ishaq and Rosen, Sherwin, "Interrelated Factor Demand Functions," *The American Economic Review*, Vol. LIX, No. 4, (September 1969), 457-471.

27. Nerlove, Marc, *Estimation and Identification of Cobb-Douglas Production Functions*, (Chicago: Rand McNally and Company, 1965).

28. ————, "On the Structure of Serial Dependence in Some U. S. Price Series," Center for Mathematical Studies in Business and Economics, Report No. 7102, University of Chicago, (January 1971).

29. Nicholls, William H., *Labor Productivity Functions in Meat Packing*, (Chicago: The University of Chicago Press, 1948).

30. Phillips, Almarin, "Measuring Industrial Capacity in Less Developed Countries," *Discussion Paper* No. 110, Department of Economics, University of Pennsylvania, Philadelphia, (January 1969).

31. Power, John H., "Import Substitution as an Industrialization Strategy," *Philippine Economic Journal*, (Second Semester, 1966).

32. Ranis, Gustav, "Industrial Sector Labor Absorption," Center Discussion Paper No. 116, Economic Growth Center, Yale University, (July 1971).

33. Scitovsky, Tibor, *Welfare and Competition: The Economics of a Fully Employed Economy*, (Chicago: Richard D. Irwin, 1951).

34. Sicat, Gerardo, "Labor Policies and Philippine Economic Development," *IEDR Discussion Paper* No. 69—4, University of the Philippines, (February 1969).

35. Smith, Kenneth R., "The Effect of Uncertainty on Monopoly Price, Capital Stock and Utilization of Capital," *The Journal of Economic Theory*, Vol. I. (June 1969), 48-59.

35a. Stigler, George J. and Kindahl, James K., *The Behavior of Industrial Prices*, (New York: National Bureau of Economic Reserach, 1970).

36. Stiglitz, Joseph E. and Uzawa, Hirofumi, eds., *Readings in the Modern Theory of Economic Growth*, (Cambridge: The M. I. T. Press, 1969).

37. Solow, Robert M., "Substitution and Fixed Proportions in the Theory of Capital," *Review of Economic Studies*, Vol. XXIV, (June 1962), 207-218.

38. ————, "The Production Function and the Theory of Capital," *Review of Economic Studies*, Vol. XXIII (1955/56), 101-108.

39. Taubman, Paul, and Wilkinson, Maurice, "User Cost, Capital Utilization and Investment Theory," *International Economic Review*, Vol. 11, No. 2, (June 1970), 209-215.

40. Williamson, Jeffrey, "Capital Accumulation, Labor-Saving and Labor Absorption: A New Look at Some Contemporary Asian Experience," SSRI Workshop Series EDIE 6932, University of Wisconsin (undated).

41. Winston, Gordon C., "Capital Utilization in Economic Development," *The Economic Journal*, Vol. 81, (March 1971), 36-60.

42. ————, "Overinvoicing, Underutilization and Distorted Industrial Growth," in Griffin, Keith and Khan, Azizur Rahman (eds.), *Growth and Inequality in Pakistan*, (London: St. Martin's Press, 1972), 169-187.

43. ————, "The Four Reasons for Idle Capital," (mimeo), Oxford, 1971.

44. ————, "Capital Utilization: Physiological Costs and Preferences for Shift Work," Williams College Reserach Memorandum No. 42, Williamstown, Mass., (October 1971).

45. ————, "A Comparison of Capital Utilization in Pakistan and the United States," in Singer, Hans, *et al*., (eds.), *Employment and Economic Development* (London: Penguin Books; forthcoming).

46. ————, "On the Inevitability of Factor Substitution," Williams College Research Memorandum No. 46, Williamstown, Mass., (April 1972).

Appendix A

The Price of Capital

It is easy to confuse three related but conceptually distinct "prices of capital:"

1. The purchase price of a unit of capital stock, $\bar{P}_m$, the price of a machine emerging from a commodity transaction and determined by supply, demand and all that.

2. The cost of owning (holding) a unit of capital stock for a period of time, $\bar{P}_m(r+d)$. This goes a step further, accommodating the opportunity cost, r,of resources tied up for the period and the depreciation due to time, d. It may also include capital gains and taxes [40]. This is the cost of owning a machine for a specified (or understood) period, regardless of how much capital service flow it provides—how much it is used.

3. The price of a unit of capital service flow, $\bar{P}_m\,(r+d^*)/ua$. $(d^* \geq d)$. This is the price of a machine-hour of service flow and is analogous to the wage rate. It depends both on the cost of owning the capital stock over the period and on how much of the time that capital stock is in use during the period, yielding a capital service flow.

The first is a price for transferring ownership; the second is a flow of costs over time; the third is a price per time-unit of a flow of service. Were labour and capital owned the same way, for labour these would be (1) the purchase price of a slave; (2) the cost of owning him for a specified period; and (3) the effective wage rate for the time he actually worked.

The price of capital service flow is conceptually simple. If $\overline{P}_m(r+d)$ is the yearly cost of owning a machine that costs $\overline{P}_m$ to buy and if that machine is used to provide a flow of capital services u proportion of the time, then the price of each machine-hour of capital service is

$$p_k = \frac{\overline{P}_m(r+d)/a}{u} .$$

If twice as many hours of capital service (or 8760 times as many) are got from the machine, the price of owning it for the year remains constant but the price of a machine-hour of capital service from it falls by half (by 1/8760), as it should. If $u = 1$, there is no difference between capital service price and owner cost.

If the assumption on depreciation is modified so that some additional depreciation comes with additional use, the fall in the price of capital service with increased utilization would be, to that extent, lessened. But it would (almost certainly) still fall, as it should.

When depreciation increases with use ($d^* = d(u)$), the necessary condition for the price of capital service to fall with increasing utilization is

$$\frac{u}{d^*} \quad \frac{\partial d}{\partial u} < \frac{r}{d^*} + 1$$

for $0 \leq u \leq 1$. To get a sense of what this means: with a 5% interest rate and 10% rate of depreciation at $u = 1$, depreciation could be quite sensitive to utilization—having an elasticity of almost 1.5—and still the capital price would fall with increasing utilization. Extensive interviews with managements suggest that it is unlikely in the extreme that going from one- to two-shift operation would even double depreciation (elasticity $= 1$) especially with adequate time for maintenance.

Finally, to push the issue to its logical end, even if $(u'/d^*)(\partial d/\partial u) > (r/d^* + 1)$ for some $u' < 1$, the price of capital service would still fall with increasing utilization over $0 \leq u \leq u'$ and that is enough to maintain the sense of the model if $u' > 1/2$. Of course, all depreciation due to use will reduce the profitability of high levels of capital utilization, *cet par.*, but unless my sense of the facts of depreciation and utilization can be shown to be terribly wrong, depreciation is unlikely to upset this analysis of its usefulness.

Appendix B

Utilization in a CES Production Function

Derivation of the conditions for optimal two-shift operation is sufficiently messy in a CES production function that it will be sketched briefly here.

For two shifts to be optimal, the inequality (3) in the text must be satisfied. It can be rearranged as

$$\text{(i)} \quad \frac{2(1+\beta/2)}{L_1/L_2} - \left(\frac{w}{2P_k}\right)^{-1} \frac{K_2}{L_2}\left[\frac{K_1/K_2}{L_1/L_2} - \frac{1}{L_1/L_2}\right] < 1,$$

dropping the day-night subscripts.

When profits are maximized in the CES function (4), relative factor prices will equal the ratio of marginal products so factor service proportions will be

$$\text{(ii)} \quad \frac{K_1}{L_1} = \left(\frac{w}{2P_k} \; \frac{\delta}{1-\delta}\right)^{\sigma}$$

on one-shift operation and

$$\text{(ii')} \quad \frac{K_2}{L_2} = \left(\frac{(1+\beta/2)w}{P_k} \quad \frac{\delta}{1-\delta}\right)^{\sigma}$$

on two-shift operation. Combining these, yields relative factor service proportions of

$$\text{(iii)} \quad \frac{K_1/L_1}{K_2/L_2} = \left[2(1+\beta/2)\right]^{-\sigma} = (2+\beta)^{-\sigma}.$$

Labour service, alone, can be derived by substituting (ii) and (ii′) into the CES function and solving for one- and two-shift labour use separately. Combining them gives the ratio,

$$\text{(iv)}\quad \frac{L_1}{L_2} = 2\left[\frac{1+\Delta^{\sigma}(2B)^{\sigma-1}R^{\sigma-1}}{1+\Delta^{\sigma}R^{\sigma-1}}\right]^{\sigma/(\sigma-1)}$$

where $\Delta = \frac{\delta}{1-\delta}$, $R = \frac{w}{2P_k}$, and $B = (1+\beta/2)$.

Finally, substituting these last results into (i), the conditions necessary for profitable two-shift operation can be expressed solely as a function of relative factor prices, the size of the shift wage premium and the elasticity of substitution, given the distribution parameter.

$$\text{(v)}\quad B\left[\frac{1+\Delta^{\sigma}R^{\sigma-1}}{1+\Delta^{\sigma}R^{\sigma-1}(2B)^{\sigma-1}}\right]^{\sigma/(\sigma-1)} - \Delta^{\sigma}R^{\sigma-1}(2B)^{\sigma}$$

$$\left\{(2B)^{-\sigma} - \left[\frac{1+\Delta^{\sigma}R^{\sigma-1}}{1+\Delta^{\sigma}R^{\sigma-1}(2B)^{\sigma-1}}\right]^{\sigma/(\sigma-1)}\right\} < 1 .$$

Fortunately, this can be simplified a good deal to yield

$$\text{(vi)}\quad B\left[\frac{1+\Delta^{\sigma}R^{\sigma-1}}{1+\Delta^{\sigma}R^{\sigma-1}(2B)^{\sigma-1}}\right]^{1/(\sigma-1)} < 1 .$$

If $\sigma > 1$, the exponent is positive and (vi) can be further simplified to

$$\text{(vii)}\quad B^{\sigma-1}[1-(2^{\sigma-1}-1)\,\Delta^{\sigma}R^{\sigma-1}] < 1 .$$

If $0 < \sigma < 1$, the exponent is negative and (vi) reduces to

$$\text{(viii)}\quad (1/B^{1-\sigma})[1-(2^{\sigma-1}-1)\,\Delta^{\sigma}R^{\sigma-1}] > 1 .$$

Appendix C

On "Technologically Continuous" Production, Entrepreneurial Preferences and Economies of Management Scale

There are three closely related influences on capital utilization that appear important in fact but simply don't fit into this neo-classical model: "technologically continuous" production, entrepreneurial preferences for daytime work and responsibility and the economies of management scale.

1. Some production is described as "technologically continuous," suggesting that it must operate at $u = 1$ as a matter of technological predestination—steel, paper and chemicals are often cited. But all of these "necessarily" continuous operations do in fact shut down; what appears to distinguish them is that they shut down only at high cost [2]. A more accurate description would be that for such processes, there is a high cost of interrupting production.

The model can reflect such operations. If interruption cost is

$$\begin{aligned} S &= S \text{ for } u < 1 \\ &= 0 \text{ for } u = 1, \end{aligned}$$

the necessary conditions for profitable night operation expressed for the general case in (3) are modified to

$$S + 2P_k(K_1 - K_2) > w\,[2(1 + \beta/2)L_2 - L_1].$$

For CES, the curves that describe the profitability of night operation in Figure 2 will be shifted downward for elasticities less than one and upward for higher elasticities. In each case the range of factor prices for which a night shift will be profitable is widened by including a non-zero interruption cost. A sufficiently large interruption cost can make two-shift operation profitable for any process or factor prices.

2. A very similar modification can incorporate entrepreneurial preferences in favour of daytime responsibilities. The model has explicitly included preferences only through the night shift wage premium. While this "wage rate" was necessarily defined broadly enough in a two factor model to include salaried night supervisors and managers, it leaves out owner-entrepreneurs whose preferences against night work may be quite strong but whose income from the firm comes in the form of profits. Their distaste for night shifts may be based on actual work at night or simply on the addition of night time responsibilities to their normal day schedule; the suspicion (and evidence from Pakistan) is that these preferences have considerable influence on the low level of capital utilization in underdeveloped countries [24, 41] reflecting the entrepreneur's discretion in a capitalist development strategy.

If night operations bring disutility to the profit-earner, there will be some amount of "reservation profit" he will be willing to sacrifice to avoid running two shifts. This can be shown as a fixed cost added to the other night shift costs in the entrepreneur's assessment of the relative profitability of night operation.* This reservation profit can be treated in the same way as interruption costs, but with opposite sign. Its magnitude would reflect the intensity of distaste for night operation and it would tend, always, to discourage high levels of capital utilization.

---

*Scitovsky demonstrated that an entrepreneur won't maximize profits if that requires him to work longer (have less leisure) than he would prefer. Instead, he will adjust profits to maximize his utility [33]. I am making a similar point, but dealing with another dimension of work to which his utility is sensitive—not the duration of work but its timing during the day.

3. Finally, as Marris stressed, the size of a firm's management group and its consequent opportunities for specialization between day and night duties will influence the level of utilization [24]. Given any level of individual disutility from night operations, the larger is the firm, the smaller (assuming managerial input proportional to output) need be the proportion of the management group involved at night, hence the smaller will reservation profit and premium managerial night salaries be per unit of output. Larger firms should, *cet par.*, have higher levels of capital utilization and the evidence is that they do [24, 41].

An Econometric Case Study of the Relative Importance of Monetary and Fiscal Policy in Nigeria

by

S. Ibi Ajayi*

I. INTRODUCTION

Since the resurgence of the classical monetary Theory [8], a lively debate has ensued about the relative roles of monetary and fiscal policy in economic stabilization. In a later path-breaking paper Friedman and Meiselman [9] claimed that the functional relationship between changes in the quantity of money and the resulting changes in income is not only more predictable but more stable than that between a change in investment and the consequent change in income. Later work took a sharper turn in discussing the choice of the policy instruments involved under different exchange rates; and the coordination of policy regardless of the exchange rate systems [14].

In recent years, there has been questions posed on the relative importance of fiscal and monetary policy in economic development. While it is generally accepted that the two policy tools are relevant, opinions differ as to the relative importance of both in stabilization policy.

In Nigeria, for instance, the emphasis is always on fiscal policy [5, p. 13; 6, p. 11].

---

* Department of Economics, University of Ibadan, Ibadan, Nigeria. Financial assistance for this work from the Rockefeller Foundation and the University of Ibadan Senate Research Grant is gratefully acknowledged.

The existing secondary role assigned to monetary policy in Nigeria is no doubt due to a narrow view of monetary policy. As aptly put by Deena R. Khatkhate "if monetary policy is construed as no more than merely a technique of monetary management, then it follows that in the absence of institutional conditions in which monetary policy is managed there is little scope for it to operate" [12]. On the other hand, when monetary policy is considered in its broader aspect not only with regard to institutional mechanics but also in terms of the interaction between money and the real economy, monetary policy then emerges as being also very important.

Both stabilization policies (monetary and fiscal) are no doubt generally "judged by how successful they are in attaining the goals of full employment, stable equilibrium prices, high output growth rates and balance of payment equilibrium" [11, p. 19]. Our work is concerned with testing empirically some proposition about the relative effectiveness of monetary and fiscal policy in changing the level of income. The paper is therefore concerned with testing the following universally accepted hypotheses for Nigeria :

(i) Fiscal policy exerts a larger influence on economic activity than monetary policy.

(ii) The response of economic activity to fiscal policy is more predictable than to monetary policy.

The second part of this paper deals with the monetarist and non-monetarist view of how fiscal and monetary policies affect the economy (the theoretical framework). The model is presented in section III. Section IV presents the empirical results while section V contains the summary and conclusions.

II. THEORETICAL FRAMEWORK

In the processes of analysing the influence of monetary and fiscal actions on economic activity three theoretical approaches are often used. The first is the Keynesian income-expenditure approach emanating from the economic thought of the late 1930's to the early 1950's. Given the liquidity preference, an increase in the quantity of money leads to a fall in the interest rate. The fall in the interest rates stimulates investment and this through the multiplier mechanism reacts on the level of income. Similarly, in the case of fiscal action, an increase in government expenditures positively affects the demand for goods and services while a change in tax policy affects disposable income which in turn affects the levels of consumption and investment.

The second is the portfolio approach associated with Baumol and Tobin. While the change in the interest rate is still very important, a change in interest rate does not affect investment decisions directly. However, it leads to a substitution between assets. The decision to invest in real assets is affected. Influence on aggregate expenditures is exercised through the changes in the supply price of capital (real rate of return on capital) relative to the market rate of interest. There are both direct and indirect influence of fiscal action. In the direct influence, we have financing government expenditures by demand debt, or financing by either taxation or public borrowing. The former enjoys the full Keynesian multiplier effect while the latter has a smaller multiplier effect. The indirect influence of fiscal action results from a change in the composition of debt [15].

In the modern quantity theory, monetary policy alters the actual stock of money relative to income. The public responds by shifting between money and other assets in order to achieve the desired relationship. This results in changes in the level of income, prices and other economic magnitudes. An increase in the quantity of money leads to an increase in investment and consumption expenditures. The impact of fiscal action depends on how the government deficit is financed. Borrowing or taxation involve a transfer of resources from the public to government. This has wealth and interest rate effects on private portfolios. The net effect is therefore ambiguous.

III. THE MODEL

The model to be used is as follows : [1]

$\Delta Y = f(\Delta G_E, \Delta R_G, \Delta N_S, \Delta Z)$

where ΔY = Change in gross domestic product,

ΔG_E = Change in government expenditure,

ΔR_G = Change in government revenue,

ΔM_S = Change in money supply,

and ΔZ = Change in variable summarizing all other forces that influence total spending.

Empirically testing the above yields

$\Delta Y = \beta_1 \Delta G_E + \beta_2 \Delta R_G + \beta_3 \Delta MS + \beta_4 \Delta Z.$

The coefficients (β's) denote the total response of the dependent variable to each of the independent variables. We cannot, however, estimate ΔZ directly. It is therefore represented by the constant term of each equation. In essence, what we have is

$\Delta Y = \alpha + \beta_1 \Delta G_E + \beta_2 \Delta R_G + \beta_3 \Delta MS$.

Alternatively, the basic relationship can be represented as

$\Delta Y = \alpha + \beta_1 \Delta MS + \beta_2 \Delta F$

---

[1] The model developed here has benefited immensely from [3].

where $\triangle M$ and $\triangle F$ represent monetary and fiscal variables respectively ; and α is the proxy for the net trend of other influences on economic activity.

In order to assess the proposition put forth earlier, we establish empirical relationships between total spending and various measures of fiscal and monetary actions. The aggregate expenditure on goods and services is represented by the gross domestic product (Y). We have used both the money stock and the monetary base as various measures of monetary action.

Three alternative measures are used for the money stock, each successively broader. MS_1 is the summation of currency plus demand deposits of the nonbank public. MS_2 is the sum of MS_1 and savings deposits (used here as an approximation to the volume of the medium of exchange) and MS_3 is the sum of currency outside banks plus the total of commercial bank deposits. Two alternative tests of high-powered money are also used. The first is the conventional high-powered money which consists of currency plus reserves. The second definition takes into consideration the institutional features of the Nigerian economy —especially the definition of reserves for the banking sector, hence high-powered money (H^*) is defined to include in addition to currency outside banks plus reserves, treasury bills outside the Central Bank [1, 2].

For fiscal policy, we have used the full employment budget surplus ($R_G—G_E$) and full employment tax revenue (R_G) and expenditures (G_E). In all these cases, we have tried to separate current expenditures from capital fund expenditures and similarly current revenue from capital funds as well.

We would expect that changes in money stock (or changes in high-powered money where used as an alternative to money stock) will be positively related to changes in the gross domestic product. The relationship between the gross domestic product and government surplus (i.e., greater deficit) is expected to be positive whereas a larger surplus (or smaller deficit) is expected to have a negative influence. Government expenditures (G_E) is a direct demand for goods and services whereas the tax revenue (R_G) affects disposable incomes. When these two are included separately (R_G) and (G_E) are expected to have a negative and positive signs respectively.

IV. EMPIRICAL RESULTS

We present the results of our empirical verification in tables I—IV. All variables have been run on first differences. The R^2 in all cases is a measure of the goodness of fit. The "t" statistics are in parenthesis under the relevant coefficients. We have used different concepts of government expenditures (G_I) and the tax receipts (R_G) as shown in the appendix. The period covered is 1960-1970. In Tables I and III the Government expenditure (G_F) variable comes with the wrong sign in all cases. Similarly tax rates (R_G) which are theoretically expected to exert a negative influence on economic activity turn out not to be so in equations (1)—(6) of Table I and (1)—(8) of Table III. They are statistically insignificant in all cases. These results seem consistent with the view of the modern quantity theorists which holds that spending, taxing and borrowing policies of the government may have through interest rates and wealth effects different impacts on economic activity under varying conditions. Many monetarists have pointed out that the government expenditure multiplier with a constant money stock is positive for a few years but zero in the long run. The argument usually advanced is the "crowding-out" effect: that government expenditures, when unaccompanied by monetary expansion, "crowd out" a significant volume of private expenditures.

In all cases, however, we find that the monetary variables (high-powered money, and money stock) come out with the right signs. Wherever we try to capture the effect of the war by including a dummy variable (WD), we find this to be statistically insignificant.

We now turn to the proposition which we originally set out to test. Let us turn to the first proposition. The proposition implies that the regression coefficients for fiscal actions without regard to signs should be larger than those of monetary action. The coefficients presented in the tables cannot be used. The reason is that the variables involve a mixture of flows and stocks. These difficulties are eliminated by the use of "beta coefficients". These coefficients take into consideration the past variations in each of the dependent variables relative to the past variation of the independent variable. The "beta coefficients' are

TABLE I

No.	Constant	ΔR_G	ΔG_E	ΔMS_1	ΔMS_2	ΔMS_3	ΔH	ΔH^*	WD	R^2	D.W.
1	39.019	1.539	—8.249	12.590					21.002	.698	2.354
	(.484)	(.205)	(—1.606)	(2.003)					(9.964)		
2	44.653	1.015	—8.222	12.852						.697	2.368
	(.839)	(.205)	(1.729)	(2.428)							
3	49.058	.579	—7.114		10.037				—50.711	.787	2.634
	(.703)	(.089)	(1.899)		(2.740)				(.269)		
4	35.903	1.802	– 7.222		9.561					.784	2.639
	(.773)	(.419)	(2.083)		(3.197)						
5	22.245	3.886	—8.026			9.247			—92.837	.746	2.794
	(.299)	(.006)	(1.798)			(2.358)			(.429)		

(Contd.)

TABLE I (*Contd.*)

No.	Constant	$\triangle R_G$	$\triangle G_E$	$\triangle MS_1$	$\triangle MS_2$	$\triangle MS_3$	$\triangle H$	$\triangle H^*$	WD	R^2	D. W.
6	2.847	2.112	-7.923			8.292				.736	2.709
	(.052)	(.441)	(1.891)			(2.733)					
7	31.020	—.253	—4.192				13.107		74.646	.780	2.265
	(.444)	(—3.833)	(1.315)				(2.669)		(.430)		
8	37.312	—.725	—5.017					12.595	—97.872	.779	2.288
	(.531)	(—.109)	(—1.496)					(2.655)	(.486)		
9	52.220	—2.399	—3.588				13.667			.773	2.446
	(1.122)	(—.589)	(1.333)				(3.070)				
10	14.892	—1.573	—5.291					11.321		.769	2.068
	(.297)	(.356)	(1.696)					(3.033)			

TABLE II

No.	Constant	ΔG_E	ΔMS_2	$\Delta(R_E-G_E)$	ΔMS_1	ΔR_G	ΔH	ΔH^*	WD	R^2	D.W.
1	41.51 (0.99)			—6.09 (—2.98)	9.07 (3.48)					.778	2.470
2	53.03 (1.06)			—6.90 (—2.56)	10.07 (2.98)				—62.49 (—0.50)	.787	2.611
3	29.31 (0.59)					—4.28 (—2.22)	13.08 (2.91)		79.67 (0.76)	.780	2.264
4	—12.76 (—0.24)			5.31 (1.82)			10.67 (2.55)		200.07 (1.80)	.741	2.206
5	15.47 (—0.28)			5.91 (1.79)				9.33 (2.37)	96.73 (0.85)	.719	2.232
6	32.41 (0.65)	—5.27 (—2.34)						12.51 (2.89)	—82.31 (—0.63)	.778	2.284
7	—29.31 (—.24)	—4.28 (—2.21)					13.08 (2.91)		79.67 (0.76)	.780	2.264

TABLE III

No.	Constant	ΔR_G^*	ΔG_E^*	ΔMS_1	ΔMS_2	ΔMS_3	ΔH	ΔH^*	WD	R^2	D.W.
1	25.027	9.626	—12.879	15.858					202.659	.847	2.923
	(.429)	(1.484)	(—3.068)	(3.446)					(1.228)		
2	74.599	3.381	—10.820	16.453						.80	2.823
	(1.709)	(.812)	(2.715)	(3.472)							
3	31.959	9.095	—11.845		12.632				118.829	.936	2.233
	(.821)	(2.124)	(4.785)		(5.866)				(1.062)		
4	60.624	5.628	—10.848		13.132					.923	1.844
	(2.144)	(2.013)	(4.693)		(6.194)						
5	—1.035	8.916	—13.893			12.579			61.520	.92	2.895
	(2.523)	(1.961)	(4.755)			(5.458)			(.505)		

(Contd.)

TABLE III (*Contd.*)

No.	Constant	ΔR_G^*	ΔG_E^*	ΔMS_1	ΔMS_2	ΔMS_3	ΔH	ΔH^*	WD	R^2	D.W.
6	12.447 (.423)	7.230 (2.477)	—13.544 (5.047)			12.931 (6.228)				.924	2.826
7	28.172 (.402)	1.449 (.187)	— 3.945 (1.195)				11.529 (2.549)		138.911 (.687)	.772	2.414
8	34.977 (.490)	.936 (.118)	— 4.404 (1.296)					10.732 (2.490)	—5.405 (2.372)	.766	2.450
9	61.644 (1.272)	—2.986 (.721)	— 2.472 (1.024)				12.274 (2.907)			.752	2.541
10	33.814 (.698)	1.089 (.256)	— 4.443 (1.612)					10.682 (3.044)		.766	2.442

TABLE IV

No.	Constant	ΔG_E^*	$\Delta(MS_2)$	$\Delta(R_G^* - G_E^*)$	(ΔMS_1)	ΔR_G^*	ΔH	ΔH^*	WD	$\bar{R}^2$	D. W.
1	65.11 (1.97)			—7.04 (—4.52)	10.99 (5.10)					.88	1.72
2	78.72 (2.02)			—7.75 (—4.08)	11.95 (4.58)				—62.42 (—0.70)	.88	1.80
3	36.11 (0.70)	—3.42 (—2.12)					11.69 (2.84)		107.50 (1.03)	.77	2.38
4	40.15 (0.77)	—4.08 (—2.21)						10.85 (2.79)	—27.15 (—0.22)	.77	2.43
5	59.17 (1.26)					—3.75 (—2.35)	12.29 (3.00)			.73	2.38
6	36.89 (0.70)					—4.54 (—1.69)		6.63 (2.47)		.66	1.72
7	73.60 (1.41)	—8.25 (—2.71)	14.55 (2.98)						10.49 (0.09)	.78	2.37
8	—14.44 (—0.29)			6.27 (2.31)			10.23 (2.98)			.73	2.33

presented in Table V. From this table, it can be easily seen that the beta coefficients for changes in monetary action are greater than that of fiscal action. Hypothesis I is therefore rejected.

TABLE V

BETA COEFFICIENTS

	ΔR_G	ΔG_E	ΔMS_1	ΔMS_2	ΔMS_3	ΔH	ΔH^*
Equation I.1	.195	—2.127	2.173				
Equation I.4	.229	—1.862		1.934			
Equation I.5	.005	—2.070			2.289		
Equation I.9	—.305	— .925				1.488	
Equation I.10	.200	—1.364					1.508
		$\Delta(R_G—G_E)$	ΔMS_1	ΔMS_2	ΔH	ΔH^*	
Equation II.1		—1.57	1.83				
II.4		.83			1.16		
5		.93				1.24	
		$\Delta(R^*—G)$	ΔMS_1	ΔMS_2	ΔH	ΔH^*	
Equation IV.1		—1.97	2.22				
IV.8		.82			1.08		

Proposition II implies that the regression coefficients relative to their standard errors (i.e., the "t"-value) should be greater for measures of fiscal action than to monetary action. The greater is the "t"-value, the more confidence and reliability is imposed on the variable. In all our reported equations, we find that the monetary variables (H, MS_1, MS_2, MS_3, H*) have larger "t" -values than their fiscal influence variables. In all cases we also find that the coefficients of the monetary influence variables come with the expected signs. We conclude therefore that the response of economic activity to fiscal policy is less predictable than to monetary policy.

A number of equations have been picked up for calculating some elasticities. This is shown in Table VI.

TABLE VI

ELASTICITY ESTIMATE OF PREFERRED EQUATIONS[1]

Dependent variable	MS_1	MS_2	MS_3	H	H*	R	(R—G)
ΔY	2.87	2.68	3.55	1.80	2.50	—.13	—.20

The table shows that the elasticities of the monetary variables are much larger than the fiscal variables. The lowest elasticity for the monetary variable is 1.80 whereas the highest elasticity for the fiscal variable is .20.

V. SUMMARY AND CONCLUSION

It is appropriate to point out some of the weaknesses of the approach used in this paper. One of them is that some of the variables treated as exogenous may not be truly exogenous. The same criticism has been levied against the Friedman-Meiselman thesis where GNP was regressed on the money supply. For example,

---

[1] The elasticities have been calculated at the sample mean as follows : $\eta = \frac{\beta_i \bar{X}_i}{\bar{Y}}$ where η =elasticity β_i is the coefficient of the i^{th} independent variable, $\bar{X}_i$ is its mean and $\bar{Y}_i$ is the mean of the j^{th} dependent variable.

is the money supply really exogenous ? Is it not influenced by changes in economic activity ? This indeed still remains a debatable question in monetary economics though recent empirical evidences have suggested that some degree of control over the money supply is exercised through the manipulation of high-powered money. One way out of this criticism, however, is that the true test of exogeneity are hard to meet and that we are alright with variables that best satisfy the criteria [4 ; 10]. Secondly, policy variables are never really exogenous in the strict sense because policy makers are influenced in their decision by the current economic environment.

This paper has not concerned itself with the processes or mechanism through which monetary or fiscal policy affect the economy but the relative importance of both (i.e., fiscal and monetary policy) on the gross domestic product.

Our empirical results have shown that the response of economic activity to monetary influences are much larger and more predictable than fiscal influences. The implication of this finding is that greater reliance should be placed on monetary actions. Such a step of course is a significant departure from the present procedure as shown in the introduction section of this paper. The monetary authorities therefore do not have to wait for desired fiscal action to be implemented. Our finding is advantageous in the sense that monetary policy has an edge over fiscal policy in terms of "flexibility, lack of need for legislative action, and rapidity of adjustment to changed conditions" [13]. Also it is further argued that "monetary policy gives freedom of choice to consumers and raises the investment/consumption ratio in underemployment situations, thereby spurring long-run growth" [13, p. 195].

The statement above is not tantamount to advocating only monetary policy for stabilization policy. While more reliance should be placed on monetary policy on the basis of evidences deduced, a coordinated policy is nevertheless advantageous. After all, none of the available policies can be viewed in isolation—fiscal policy has been known to have monetary effects. The attainment of a balance of payments equilibrium and sustained growth in the gross domestic product can be more easily attained with a combination of fiscal and monetary policy.

Appendix

LIST OF VARIABLES

D.W. =The Durbin-Watson Statistics.

G_E =Government current expenditures in millions of Naira.

G_E^* =Government current and capital expenditures in millions of Naira.

H =High-powered money (i.e., Currency in the hands of the public plus Reserves of the banks).

H^* =H + Treasury bill issue outside the Central Bank.

MS_1 =Currency + demand deposits of the non-bank public.

MS_2 =MS_1 + Savings deposits.

MS_3 =Currency outside banks plus the total deposit liabilities of the commercial banking sector.

R_G =Government current revenue in millions of Naira.

R_G^* =Government current revenue plus capital fund.

WD =War dummy which takes the value of 1 in 1967-69 and zero otherwise.

REFERENCES

1. Ajayi, S. I., "The Monetary Base in Nigeria," *Journal of Modern African Studies*, March 1973.

2. ——————, "A Critique of the Money Multiplier Approach to Money Supply Determination," *Nigerian Journal of Economic and Social Studies*, July 1972.

3. Anderson, L. C. and Jordan, J. L., "Monetary and Fiscal Actions—A Test of Their Relative Importance in Economic Stabilization," *Federal Reserve Bank of St. Louis*, November 1968.

4. Brunner, K., "The Nature of the Problem," in *Targets and Indicators of Monetary Policy*, (California: Chandler Publishing Company, 1969 .

5. Central Bank of Nigeria, *Annual Reports* 1965.

6. ——————, *Annual Reports* 1970.

7. Dernburg, Thom F., "Exchange Rates and Coordinated Stabilization Policy," *Canadian Journal of Economics and Political Science*, February 1970.

8. Friedman, Milton, "The Quantity Theory of Money—A Restatement," *Studies in the Quantity Theory of Money*, (Chicago: University of Chicago Press, 1958).

9. ——————, and Meiselman, "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States 1897-1958" in *Commission on Money and Credit Stabilization Policies*, 1965.

10. Gambind, A., "On the Endogeneity of the Money Stock," *Banca Nazionale Del Lavoro Quarterly Review* 94, September 1970.

11. Gurley, J. G., "Have Fiscal and Monetary Policies Failed?" *The American Economic Review Paper and Proceedings*, May 1972.

12. Khatkhate, Deena R., "Analytic Basis of the Working of Monetary Policies in Less Developed Countries," *I. M. F. Staff Papers*, November 1972.

13. Kreuger, Anne O., "The Import of Alternative Government Policies Under Varying Exchange Systems," *Quarterly Journal of Economics*, Vol. LXXIX, May 1965.

14. Mundell, R. A., "Capital Mobility and Stabilization Policy Under Fixed and Flexible Exchange Rates," *Canadian Journal of Economics and Political Science*, February 1970.

15. Tobin, J., "An Essay on Debt Management," *The Commission on Money and Credit*, 1963.

Foreign Capital Inflow, Saving and Economic Growth—A Case Study of Bangladesh

by

MOHIUDDIN ALAMGIR*

I. INTRODUCTION

A considerable amount of literature is available on the effect of foreign capital inflow on national saving and economic growth of aid receiving countries. However, like many other issues in economics, no general consensus seems to have emerged on this either.[1] Foreign capital inflow, as understood by different authors seem to carry different meaning statistically, so that it often becomes difficult to compare results of different studies trying to prove or disprove a particular point.[2] Using cross-country and/or time series data these authors make the following conflicting claims.

(i) Foreign capital inflow adds to national saving and investment and therefore affects income positively [4, 7, 19].

(ii) Foreign capital inflow has negative effect on national saving and therefore on balance it may have retarding effect on development [4, 5, 8, 9, 17, 22].

---

*The author is a Senior Research Economist at the Bangladesh Institute of Development Studies. He is deeply indebted to Mr. Atiqur Rahman, a Staff Economist at the Institute, who was very closely associated with the empirical work of this study. Thanks are also due to Dr. A. Ghafur for his comments on an earlier draft. The author also gratefully acknowledges the assistance provided by Mrs. Pratima Paul and Mr. A. B. M. Shamsul Islam of the Institute during the course of the study. However, the author alone is responsible for any error.

[1] For a critical survey of the various positions on the effect of external assistance on economic development, see Papanek [13].

[2] Three definitions of foreign capital inflow have been used, (a) deficit on the commodity trade account, (b) deficit on commodity trade and services account and (c) deficit on commodity trade, services and factor payments account. See, *ibid.* p. 940.

(iii) The effect of foreign capital inflow on national saving, investment and income is indeterminate [13].

In his article, Papanek summarises the arguments presented by proponents of (i) and (ii) above. He, however, goes on to claim that while the view that foreign capital inflow is additive to national saving is rather naive, the statistical evidence provided by the supporters of the other view do not really prove that foreign capital inflow in a large number of cases has gone in to substitute for national saving effort. Although the weight of his analysis seems to favour the contention (i) above, one may also characterise it as (iii) since he qualifies his position by a number of preconditions which, according to him, interact with one another in determining the total effect of foreign capital inflow on national saving, investment and income. He maintains that the outcome of an inflow of foreign capital into a country in terms of its effect on variables under consideration depends on, (a) implicit saving functions—he discusses two different sets of "plausible savings functions", which in one instance "would result in a fall in domestic savings, and a small or zero increase in investment, as a result of foreign inflows", and in the other, "would produce a rise in savings, and a substantial increase in investment, as a result of foreign inflows" [13, pp. 936-37], (b) method of accounting – his main concern is the treatment of grants for consumption about which he says, "it is..... misleading to reduce domestic savings by the amount of foreign resources received as a grant for consumption purposes" [13, p. 939].[3] (c) methods of aggregation and estimation of investment and foreign capital inflow [13, pp. 939-40], and (d) exogenous factors—"which simultaneously make for higher foreign resource inflows, and lower savings and growth rates, or vice versa" [13, p. 942].

It is clear that there are many methodological and empirical problems in determining the direction and magnitude of the effect of foreign capital inflow on development. Needless to say, such an enquiry has serious implication for the

---

[3] Professor Newlyn [12, pp. 867-68] points out that the problem of "a misleading reduction in savings" will not arise "if the correct definition of current account deficit is used in which current transfers, as distinct from captial transfers are included in the current account. When this definition is made (as in the U. N. Standard National Accounting System) consumption grants will be included in current transfers and will thus not be deducted from investment in calculating national savings."

developing countries like Bangladesh, in terms of formulation of policies towards foreign capital inflow and domestic resource mobilisation. The interdependence of the two becomes apparent when one considers the fact that while on the one hand, foreign capital inflow may augment government or private consumption as claimed by many, on the other hand, in cases where a country is suffering from shortage of foreign exchange required to finance development imports, foreign capital inflow augments investible resource. Furthermore, in countries like Bangladesh, a large part of the public revenue in the form of customs duties and sales tax is import dependent and thus in turn depends heavily on foreign capital inflow given the fact that during the 60's foreign capital financed about 20-25% of total imports into the country.

It may be pointed out here, that cross-country analysis may not be valid for determining the effect of foreign capital on growth. In addition to the measurement (of variables) problem mentioned above, one of the basic assumptions of the ordinary least squares regression which is usually applied to test the hypothesis regarding the underlying relationship between capital inflow and saving and growth, that is constant (equal) standard deviations of the residuals may not hold because of the influence of exogenous variables, some of which are identified by Papanek, operating in the case of individual countries. Therefore, application of ordinary least squares will produce unbiased but not minimum variance estimates. Furthermore, for similar reasons the assumption that residuals are normally distributed may not be valid so that the probability based tests of significance on the estimated coefficient will be rendered inadmissible. On either count the results of such exercises will be of little or no value. Finally, the cross-country results have no relevance for any particular country unless careful analysis is carried out of the interaction of all relevant variables in affecting saving, investment and income of that country over time.

Therefore, it follows that one would have to fall back upon examining the case of individual countries on the basis of time series data to determine the effect of foreign capital inflow. However, at the empirical level two notes of caution should be added. First, one must be careful about the definition and measurement of the underlying variables. Second, the results must be interpreted with caution because some of the objections mentioned above in the case of cross-country analysis may also be valid for time series analysis. Besides, one must be aware of the short and long run implications of the results from such an analysis aimed at establishing a causal relationship between capital inflow on the one hand, and saving, investment and income, on the other.

This paper uses data from a relatively short time series for Bangladesh in order to examine the effect of foreign capital inflow on saving and income growth. For Bangladesh such an analysis is first of its kind. Presumably this could not be undertaken in the past because of lack of data. Nurul Islam [11] in an earlier study examined the relationship between the rate of saving and investment, on the one hand, and the rate of capital inflow, on the other, within the context of pre-March 1971 Pakistan. He carried out a descriptive analysis without formulating any explicit analytic model in order to examine the aforesaid relationship. His analysis indicates that while there was an inverse relationship between the rates of capital inflow and saving in the 50's, the 60's were characterized by a positive relationship between the two.

The present study represents a significant departure from other time series studies available in the literature on the relationship between capital inflow and saving and growth. First, unlike most of these studies, foreign capital inflow has been defined as the deficit on the current account of the balance of payments inclusive of transactions in commodities and services and factor payments and receipts. Second, the analysis is carried beyond macro-economic aggregates to examine the impact of foreign capital inflow on the behaviour of different saver groups in the country separately. Three saver groups are indentified in this study ; these are, the noncorporate private sector, the corporate sector and the government sector. Third and the most important, the saving estimate, national and sectoral (by saver groups), used here are direct estimate of saving, as opposed to indirect or residual estimate of saving which provided the basis of analysis in all other studies.[4] Therefore, all the difficulties arising from methods of accounting and estimation of investment and foreign capital inflow are avoided here.

---

[4] The indirect estimate of saving is derived from the *export* national income identity which states that, the saving-investment gap equals the export-import gap. The direct estimate of saving is arrived at by summing over the separate estimates for individual sectors identified above. Both income accounts and balance sheets, depending on their availability were used to estimate saving of the individual sectors. To avoid double counting intersectoral transactions were netted out.

However, because of lack of data no attempt was made to disaggregate data on foreign capital inflow by types and sources although it would have been very desirable in order to examine the causality more closely. As indicated earlier, no attempt will be made also, to compare the present findings with others available in the literature, because the underlying conceptual and empirical problems make such comparison meaningless.

It is hypothesized here that, other things remaining the same, the relationship between foreign capital inflow, on the one hand, and saving and income, on the other, should be a positive one. That this should be the outcome in a country like Bangladdesh in the short run, even if a part of the foreign capital inflow goes in to augment consumption, can be seen from the fact that, (a) foreign capital inflow adds to investible resources and assuming no significant change in capital/output ratio raises income, (b) given a large non-competitive import component of investment in developing countries, a significant proportion of *ex ante* saving may remain unrealised if complementary imports (of investment goods) financed largely by foreign capital inflow are not forthcoming. In the short run the above outcome may be negated only if exogenous forces[5] act to depress marginal propensity to save and/or output levels.

The above, however, has nothing to do with the long run criteria for accepting foreign assistance, the question to which A. Qayum [15] and A.K. Sengupta [20] have addressed themselves. Chenery [7] also examines the long run implication of foreign capital inflow for economic development of less developed countries. A positive relationship between foreign capital inflow and saving and income in the short run does not indicate the desirability of it from a long run point of view. In the long run, a unit of foreign capital inflow will be worthwhile if the short run gains can be consolidated in a manner so as to sustain an increase in income and saving that would at least be adequate to pay off the debt liability in its entirety within a stipulated time period. Therefore, debates over the results of short run exercises can serve only a limited purpose unless account is taken of the long run effects.

---

[5] Exogenous forces that may affect saving and growth adversely, include (i) war, (ii) violent change in terms of trade, (iii) unfavourable weather and natural calamities, (iv) a period of continued inflation (or hyperinflation), and (v) political instability. See [15, pp. 942-45].

Section II discusses briefly the sources of data and methodology of analysis. Results of the study are discussed in Section III. A careful analysis is presented of the *modus operandi* of the causal relationship (if found any) between the relevant variables. Both aggregative and sectoral results are discussed in this Section. Finally, some concluding remarks are presented in Section IV.

II. SOURCES OF DATA AND METHODOLOGY

This study covers the period 1959/60—1969/70. The choice of the period was essentially given by the availability of data. In this respect data on national saving was the limiting factor. These were available only for the period mentioned above. Other data required were estimates of foreign capital inflow, gross domestic product (GDP) originating in various sectors and rate of growth of income. As mentioned before, the saving estimate referred to here is the direct estimate of saving which, as expected, is different from the indirect estimate. The saving estimate is due to Alamgir and Rahman [3]. Estimates were available for the country as a whole as well as by different saver groups mentioned above.

Estimates of GDP, rate of growth of income and foreign capital inflow are due to Alamgir and Berlage [2].

Foreign capital inflow is defined here as the deficit on the current accout of the balance of payments. Therefore, it is not just the balance on the commodity trade account, nor it is the balance on commodity and services account as defined in some studies. It rather represents the balance on the account inclusive of commodities and services and factor payments. One interesting feature of the balance of payments of Bangladesh over the period under consideration should be pointed out here. Bangladesh had trade relations with Pakistan as well as other foreign countries and separate accounts were maintained for trade with each. However, trade with Pakistan did not involve any foreign exchange transaction. Data on trade with Pakistan and other foreign countries were combined to estimate foreign capital inflow and no attempt was made to find out the differential impact of positive or negative capital inflow from these two sources on national saving and income in Bangladesh. The reason for this is obvious. Since Bangladesh is now a sovereign country, its past should be analysed in a manner so that comparability with the future is maintained, All figures used here are in million taka/current prices. The rate of growth of income refers to annual rate of growth of GDP at constant (1959/60) factor cost.

The methodology of analysis adopted here is basically the classical least squares regression. Alternative specifications have been examined by applying both single variable regression as well as multiple regression analysis. However, in all cases only linear specifications were used. There was no *a priori* theoretical or empirical ground for formulating nonlinear hypotheses. In any case, such an effort would not have been very productive given the inadequacy of short time series to test complicated models. In the models examined here, the direct estimate of saving or the rate of growth of income was used as the dependent variable, while income and foreign capital inflow (current and lagged) were used as independent variables either alone or together in multiple regressions. In addition to the aggregate relationship separate equations were estimated for the noncorporate private sector, the corporate sector and the government sector. The coverage of these sectors are discussed in [3].

III. FINDINGS OF THE STUDY

Table I presents data on net foreign capital inflow and expresses it as a proportion of GNP. This is compared with the ratio of saving to GNP and the two ratios are presented in Figure 1. Comparing the changes over time in the two ratios it appears that there were some year to year fluctuations in both series although clearly the flucutations during the Third Five Year Plan of the erstwhile Government of Pakistan were less pronounced than those during the Second Five Year Plan. However, during the later part of the 60's the national saving performance was relatively more unstable than net foreign capital inflow. This is quite understandable in view of the fact that while following the armed conflict with India in 1965, the economy was slow in picking up investment activity, there was some conscious effort, due to political pressure to direct relatively more resources for investment in Bangladesh as compared with the earlier periods. If one considers the period 1959-70 as a whole, net foreign capital inflow was about a third of national saving except in 1962/63 and 1964/65 when it was almost half.

TABLE I

GNP, SAVING AND NET FOREIGN CAPITAL INFLOW : BANGLADESH 1959/60—1969/70

(Taka in million/current prices)

Year	Saving (1)	Net Foreign Capital Inflow (2)	Gross National Product (3)	Col. (1) as % of Col. (3) (4)	Col. (2) as % of Col. (3) (5)
1959/60	898	42	14490	6.2	0.3
1960/61	1042	477	16357	6.4	2.9
1961/62	1210	347	17491	6.9	2.0
1962/63	1088	488	18527	5.9	2.6
1963/64	1571	797	18706	8.4	4.3
1964/65	1774	950	20672	8.6	4.6
1965/66	2135	728	22870	9.3	3.2
1966/67	2186	814	26456	8.3	3.1
1967/68	2370	862	28197	8.4	3.1
1968/69	2515	1043	29880	8.4	3.5
1969/70	2940	1100	32630	9.0	3.4

Sources : Col. 1—[3], Col. 2 and 3 [2].

Now, if one accepts the direct estimate of saving as reasonable and also assume that all of the net foreign capital inflow go into investment, then one can obtain an alternative estimate of total investment in Bangladesh by adding the two. These figures are presented below in Table II along with the ratios of net foreign capital inflow to the new investment estimates for Bangladesh. These ratios indicate even lesser dependence on foreign capital by Bangladesh than what was obtained elsewhere by using direct investment estimate [3].

A number of relationships have been estimated using aggregate data and the results are presented in Table III. Two general conclusions can be immediately drawn from this. (i) For Bangladesh, it seems there was a significant positive causal relationship between foreign capital inflow and national saving. In other words, the general effect of foreign capital inflow has been to produce a rise in national saving. (ii) There was no close association between net foreign capital inflow and the rate of growth of GDP at constant (1959/60) prices. Before these findings are examined further, it will be worthwhile to analyse the individual relationships as presented in Table III.

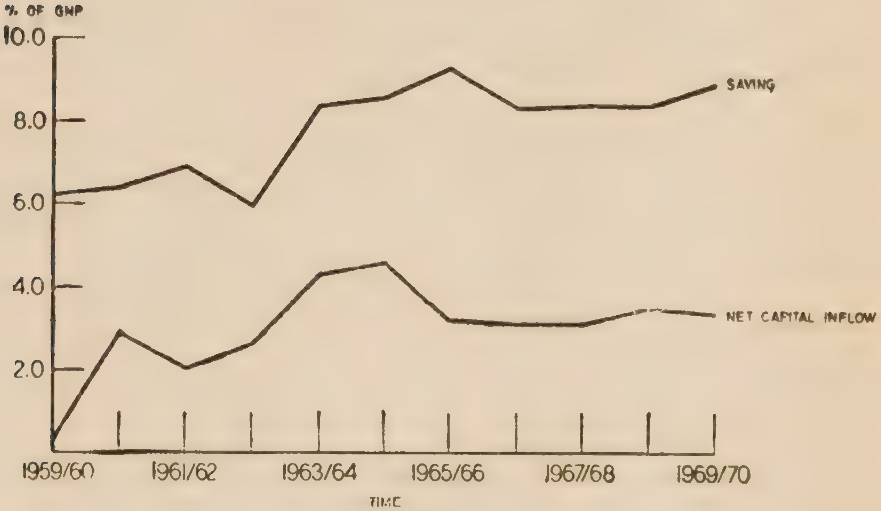


FIGURE 1

TABLE II

NET CAPITAL INFLOW AND ITS RELATION TO NEW INVESTMENT ESTIMATE IN BANGLADESH : 1959/60—1969/70

Year	New Investment Estimate (Tk. million/current prices)	Net Foreign Capital Inflow as % of New Investment Estimate
1959/60	940	4.5
1960/61	1519	31.4
1961/62	1557	22.3
1962/63	1576	31.0
1963/64	2368	33.7
1964/65	2724	34.8
1965/66	2863	25.4
1966/67	3000	27.1
1967/68	3232	26.7
1968/69	3558	29.3
1969/70	4040	27.2

Source : Table I.

TABLE III

REGRESSION RESULTS : IMPACT OF FOREIGN CAPITAL ON NATIONAL SAVING AND GROWTH IN BANGLADESH

Variables : S_D = Direct estimate of saving ;

F = Net foreign capital inflow ;

Y = Gross National Product ;

and $\dot{Y}$ = Annual rate of growth of Gross Domestic Product at constant (1959/60) factor cost.

All absolute figures are in taka million current prices. S. E. E. represents standard error of estimate.

Equations	R^2	S. E. E.
(1) $S_D = 494.0 + 1.876^a F$ (1.93) (5.45)	0.77	348.4
(2) $S_D = 641.79^b + 1.904^a F_{-1}$ (2.67) (5.66)	0.80	304.1
(3) $S_D = 233.0 + 1.194^c F + 1.140^b F_{-1}$ (0.847) (2.155) (2.530)	0.88	255.8
(4) $S_D = -530.0^b + 0.090^a Y + 0.446 F$ (2.488) (5.844) (1.533)	0.96	161.9
(5) $S_D = -383.7 + 0.078^a Y + 0.700^b F_{-1}$ (1.662) (5.462) (2.591)	0.96	146.4
(6) $\dot{Y} = 7.79^a - 0.00456 F$ (3.28) (1.52)	0.20	3.0
(7) $\dot{Y} = 6.12^b - 0.0029 F_{-1}$ (2.528) (0.966)	0.08	3.3

Figures within parentheses represent t-statistics.

[a]significant at 99% level.

[b]significant at 95% level.

[c]significant at 90% level.

Both lagged and current year value of foreign capital inflow have significant coefficients at conventional levels when regressed separately with saving as well as together in a multiple regression. In all cases R^2 is quite high although, as expected, the standard error of estimate is lowest in the case of equation (3). One plausible explanation for a significant coefficient is that Bangladesh being a very low-saving country because of the subsistence level of the economy, the rate of growth attained over this period (4.4%) could not be achieved, given a reasonable assumption about the underlying capital output ratio, without the capital inflow that actually took place during the period under consideration. Thus the causality runs from foreign capital inflow to investment to income and then finally to saving. The significance of the coefficients associated with both the current and lagged variables is explained by the composition of foreign capital inflow. Foreign capital inflow consists of both commodity and project loans or aid. The former helps better utilization of existing capacity through import of raw materials and spares and hence affects current income and saving, while the latter being tied to specific projects affect income and saving with a time lag. Evidence presented here suggest that a one year time lag represents a reasonable assumption. The arguments given to explain the above positive relation between foreign capital and saving would appear quite plausible if one considers the fact that investment and current inputs into many industries in Bangladesh have very high import contents so that foreign capital directly aid investment and the level of utilization of existing capacity and thereby raise both income and saving.

A multiple regression with income and foreign capital as independent variables produced good result when the latter was lagged. The insignificance of the current year variable can perhaps be explained by high correlation between current income and capital inflow, thus creating the problem of multicollinearity which produced a high standard error of the estimated coefficient of foreign capital inflow. Clearly, almost all of the variations in national saving during the period under consideration are explained by variations in income and foreign capital inflow. What is very important to note here is that the absolute magnitude of the foreign capital coefficient is much larger than that of the income coefficient. Furthermore, the marginal propensity to save (9.0%) out of current income as obtained from equation (4) is lower than what was obtained (11.0%) in the case when direct saving estimate was alone regressed on income [3].

More interesting but somewhat puzzling are the results obtained from regressions with the rate of growth of the GDP as the dependent variable and foreign capital inflow (current and lagged) as the explanatory variable. In the case of both current and lagged variable, the coefficients are not significant at any conventional level and the R^2 is also very low. Furthermore, if anything, foreign capital inflow has negative effect on the rate of growth of income.[6] This appears to be in conflict with the earlier finding, that foreign capital had positive effect on investment, income and saving in Bangladesh. However, a slight reflection will reveal the consistency of the two results. Foreign capital while having a positive effect on the absolute level of income will also help raise the rate of growth income provided, the amount of aid is sizeable, that it is sustained over a long period of time and that it grows over time until such time as the rate of national saving reaches a reasonably high level. However, as explained before, the absolute level of the foreign capital inflow has been rather erratic over this period, and particularly during the later half of the 60's it maintained a fairly stable relationship with GNP. And also other available evidence [14] indicate that in the early and late 50's the inflow of foreign capital into Bangladesh was quite insignificant. It should be made clear, however, that the above findings must not be taken to mean that it is desirable for Bangladesh to continue to depend on foreign capital inflow to maintain a high level of investment. On the contrary, effective policy measures should be adopted at the national level to transform Bangladesh from a low-saving economy into a high-saving one. Foreign capital inflow should be accepted only to the extent to which it makes possible investments of the kind which will change the structure of the economy and generate a capacity within it to pay the interest and amortization on the loans taken without much stress and strain in the future.

Separate functions were estimated in order to find out the effect of net foreign capital inflow on the saving of the noncorporate private sector. The reason for relating sectoral saving to net foreign capital inflow is that the overall effect of capital inflow on national saving may be positive or negative depending on its effect on major components (by sector) of saving. In point of fact, theoretically

---

[6] This result can be compared with a similar finding by Griffin and Enos for Latin America. See, Griffin, K. B. and Enos, J. L. [9].

foreign capital inflow can have positive impact on the saving of one or more sectors and negative impact on others. The outcome on balance would depend on the relative importance of the sectors concerned. In this instance, the general finding being that foreign capital inflow had positive impact on the overall level (absolute) of saving in Bangladesh, a similar result is expected when capital inflow is related to noncorporate private sector saving since the latter is the most important component of national saving in Bangladesh.

Regression results presented in Table IV confirm the hypotheses presented above. The coefficients of foreign capital inflow (current or lagged) are positive

TABLE IV

NONCORPORATE PRIVATE SECTOR SAVING AND FOREIGN CAPITAL INFLOW

Variables : S_{NC} = Noncorporate private sector saving,

Y_{NC} = Noncorporate private sector disposable income,

and F = Foreign capital inflow.

All variables are measured in taka million/current prices.

Equations	R^2	S.E.E.
(8) $S_{N\dot{C}} = 302.43 + 1.252^a F$ (1.74) (5.28)	0.76	239.8
(9) $S_{N\dot{C}} = 398.98^c + 1.267^a F_{-1}$ (2.18) (4.94)	0.75	235.1
(10) $S_{N\dot{C}} = -428.0^b + 0.0687^a Y_{NC} + 0.3302 F$ (2.404) (4.872) (1.448)	0.94	128.0
(11) $S_{NC} = -414.0^b + 0.0659^a Y_{NC} + 0.433^c F_{-1}$ (2.287) (5.109) (2.083)	0.95	114.9

Figures within parentheses represent t-statistics.

[a] Significant at 99% level.

[b] Significant at 95% level.

[c] Significant at 90% level.

and significant at conventional levels. The *modus operandi* of this causal relationship seems to be the following. In Bangladesh during the period under study, net foreign capital inflow has partly gone into investment and partly into consumption primarily in the form of food import under PL-480. The portion that went directly into investment helped raise income and therefore saving, with a time lag. On the other hand, the food import had positive effect on current income in two ways. First, imported foodgrains were sold through a system of rationing[7] at subsidized prices in urban areas which helped raise the real income of the individual households in these areas. The effect of a rise in real income on saving is likely to be positive. Secondly, the fund generated from the sales of the imported foodgrains was available to finance a part of the development expenditure particularly in the rural works programme which also helped raise income and saving. As a matter of fact, from the point of view of the economy, a part of the expenditure in rural works programme can be considered as saving in the form of non-monetized investment in rural areas.[8]

However, when income and net foreign capital inflow are entered into a multiple regression as explanatory variables, the coefficient of capital inflow when not lagged turns out to be insignificant and when lagged is significant only at 90% level. This is not unexpected since income and foreign capital inflow seem to be correlated, thus making it difficult to have significant coefficients for both variables by ordinary least square regression.

Some regression equations have also been estimated to find out the effect of net foreign capital inflow on corporate sector saving. Both current and lagged net capital inflow have been regressed, individually, and along with corporate profit, on the corporate saving. The results of the regressions are presented below in Table V.

---

[7] For a study on foodgrain demand in Bangladesh under rationing see Alamgir, M. and Berlage, L. [1].

[8] Opinions differ, however, about the impact of rural works programme on domestic capital formation. For two views on this see [18, 21].

TABLE V

CORPORATE SECTOR SAVING AND FOREIGN CAPITAL INFLOW

Variables : S_C=Corporate sector saving,

and Y_C=Gross profit of the corporate sector. All variables are measured in taka million/current prices.

	Equations	R^2	S.E.E.
(12)	$S_C = 43.55^a + 0.21^a F$	0.78	38.20
	(3.77) (5 57)		
(13)	$S_C = 56.79^a + 0.22^a F_{-1}$	0.90	23.99
	(7.68) (8.39)		
(14)	$S_C = -10.47 + 0.67^a Y_C + 0.01 F$	0.98	10.92
	(1.02) (9.77) (0.49)		
(15)	$S_C = 97.61^a + 0.61^a Y_C + 0.04 F_{-1}$	0.99	9.81
	(7.42) (6.45) (1.27)		

Figures within parentheses represent t-statistics.

[a]significant at 99% level.

The result show that coefficients of both current and lagged foreign capital inflow are positive, and significant at 99% level of confidence. The reason for such behaviour of corporate sector saving may be the following.

Corporate sector which is comprised of a large number of industrial companies depend to a large extent on foreign exhange either for the expansion of capacity or for the purchase of spare parts and raw materials needed to utilise the existing capacity. Foreign aid which is an important element of the total foreign exchange resource of the country may be, as mentioned before, either project aid or non-project aid. The disbursement of non-project aid is rather fast and its effect in helping the industries either to expand or to run with greater efficiency reflected in higher capacity utilization, may be felt in the same year in which non-project aid is granted and disbursed. Increased capacity utilisation means increased production and gross profit and, hence, increased saving. But project aid which is mostly related to new investment in the industrial sector affect the income of this sector after a lag of one or two years. Hence, both current and lagged net capital inflow have a significant effect on the corporate sector saving.

Equations (14) and (15) present the results of multiple regressions of current and lagged net capital inflow along with the corporate sector profit on the corporate sector saving. In each case, gross profit has positive coefficient significant at 99% level of confidence. But the coefficients of F and F_{-1} in contrast to the coefficients of these variables in the equations (12) and (13) are insignificant. One explanation of this type of behaviour is the high multicollinearity between F or F_{-1} and the corporate sector profit, which given the short time series made it impossible to obtain significant coefficients of both variables.

It may be pointed out that other variables such as, government policies regarding taxation, licensing or capital issues and decisions at the company level about retained earnings for further expansion interact with foreign capital inflow to affect the corporate sector saving. No quantitative measurement of the effects of such variables are possible because of inadequate information about them.

Finally, an attempt is made here to analyse the effect of net foreign capital inflow on public saving. This relationship is important since the greater proportion of foreign capital flows directly into the public sector although a portion of it may be disbursed later to the private sector by the government. This is particularly true in Bangladesh where a recent study by the Planning Commission has revealed that foreign private capital inflow into Bangladesh has been minimal.[9]

One trend of thinking in the literature indicates that foreign capital inflow through its negative effect on public saving will have similar effect on national saving. This is so, because national saving is primarily a function of government policies and therefore since the government is likely to slacken its effort at generating surplus as foreign capital inflow increases, the net effect is a reduction in national saving [13, p.936]. Although some evidence is presented, yet it is

---

[9] The study reveals that in the pre-March, 1971 Pakistan foreign private investment averaged Tk. 80 million per annum and of this Bangladesh did not receive more than 25%. During 1959-63 average annual inflow of foreign private capital was no more than Tk. 20 million.

possible to reflect further on this point. An alternative line of argument could be that the government in anticipation of large foreign capital inflow, may have to gear up its effort to generate surplus in order to provide local counterpart funds to projects involving foreign investment. Under such circumstances a positive relationship may emerge between foreign capital inflow and public saving irrespective of whether current or lagged variable is used. Besides foreign capital inflow being closely related to imports, has direct influence on government income by way of increased customs revenue and sales tax receipts and thereby the government saving is likely to be positively affected.

The findings from data on Bangladesh confirm the new line of argument as can be seen from the equations presented below. S_G represents public saving.

$$(16) \quad S_G = \underset{(1.735)}{148.40} + \underset{(3.653)}{0.41^{a}} F$$

$R^2 = 0.60$ and standard error of estimate $= 114.21$.

$$(17) \quad S_G = \underset{(2.33)}{183.59^{b}} + \underset{(3.853)}{0.42^{a}} F_{-1}$$

$R^2 = 0.64$ and standard error of estimate $= 101.06$, t-statistics are presented within parentheses. Variables are measured in the same way as before.

Clearly, both coefficients are significant at 99% level and the positive sign indicates that foreign capital inflow helped to raise public saving in Bangladesh during the period under study. However,lagged variable seems to explain public saving better and the corresponding equation reveals a lower standard error of estimate. Attempt to introduce income and capital inflow variables together in the same equation failed to a large extent because presence of a high multicollinearity between government income and foreign inflow made the coefficient of the latter insignificant. One must also admit that the time series was rather short for testing any sophisticated hypothesis.

IV. CONCLUDING REMARKS

Some exercises were carried out above to examine the effect of foreign capital inflow on national saving and income in Bangladesh. Analysis revealed that, in general, foreign capital inflow had positive effect on saving and income, both at the aggregate and the sectoral level. These findings were consistent with the hypothesis presented in Section I regarding the plausible effect of foreign capital inflow in the short run. Another finding which was also easily explained was that there was no significant relationship between the rate of growth of income and foreign capital inflow in Bangladesh. That few other studies in the literature obtained contrary results using time series data may be primarily due to differences in specification and measurement of the relevant variables and also due to the influence of exogenous factors. As mentioned before, no useful purpose will be served by carrying out detailed comparison of the different results.

However, the important question that remains to be answered in most of the empirical studies including the present one is, to what extent foreign capital inflow has laid the foundation of future growth in income and saving so that the recipient country can look forward within a reasonable period of time towards embarking upon the path of self sustained growth during which adequate saving will be mobilised in excess of investment requirement so as to repay the foreign debt liability. This is the crux of the issue for the recipient country if it is to formulate a rational policy towards foreign capital inflow. In this context what needs to be ensured by the recipient country is the productive utilisation of foreign capital inflow, be it in the form of addition to investible resource or current consumption. The latter as pointed out above and also elsewhere [16] can be productive in the sense that it can help increase income and saving, although such increment can not be sustained for long without both supplementary and complementary domestic effort. The long run goal of foreign capital inflow may not be realised if sufficient safeguards are not available to avoid (a) high cost of tied aid, a phenomenon extensively discussed in the literature [10], (b) the trend towards inequity in the distribution of income and political power, (c) resource allocation in favour of less productive sectors (productivity must be looked at from a relatively long term perspective) and classes of people in the society, and (d) such changes in social and economic policies and institutions as may turn out to have retarding effect on the process of long term social and economic development although short run results may be quite different.

What is most important to note is that foreign capital inflow even if it is found to have favourable short and long run effects under the conventional analysis presented above, may prove otherwise because of the likely impact of the structural dependence of the aid recipient countries on the donor countries which is effected through the process of aid flow. The recipient country remains susceptible to the danger of such dependence to the extent it buys or borrows technology from advanced countries by way of utilising foreign capital inflow. There are three types of manifestation of the danger inherent in the structural (technological) dependence mentioned above. (a) The aid recipient countries may be forced to adopt technologies that are not consistent with its own resource endowments. (b) The technological dependence may be used by the donor countries even after the cessation of capital inflow, to extract political and economic favours from the aid receivers. (c) Finally, the aid recipient countries may be forced to follow the same cycle of technological obsolescence as the advanced countries at a very heavy resource cost.

Although somewhat of a digression, yet the observations in this concluding section were necessary in order to get a better insight into the implication of the findings in studies including the present one, attempting to examine the relationship between foreign capital inflow, on the one hand, and saving and income, on the other. In point of fact, this provides an appropriate framework within which the future analysis of the present findings must be carried out.

REFERENCES

1. Alamgir, M. and Berlage, L., "Foodgrain (Rice and Wheat) Demand, Import and Price Policy for Bangladesh," *The Bangladesh Economic Review*, Vol. I, No. 1, January 1973.

2. ——————————, *Bangladesh: National Income and Expenditure*, 1949/50—1969/70, Research Monograph No. 1, Bangladesh Institute of Development Studies, Dacca, 1974 (forthcoming).

3. ——————, and Rahman, A., *Saving in Bangladesh* 1959/60—1969/70, Research Monograph No. 2, Bangladesh Institute of Development Studies, Dacca, 1974 (forthcoming).

4. Chenery, H. B. and Eckstein, P., "Development for Latin America," *Journal of Political Economy*, July/August 1970.

5. ——————, Elkington, H. and Sims, C., "A Uniform Analysis of Development Patterns," Economic Development Reports, Nos. 148 and 158, Center for International Affairs, Harvard University.

6. ——————, "Objectives and Criteria of Foreign Assistance," Ranis, G. (ed.) *The United States and the Developing Economics*, (New York: W. W. Norton Co., 1964).

7. ——————, and Strout, A. M., "Foreign Assistance and Economic Development," *American Economic Review*, September 1966.

8. Griffin, K. B., "Foreign Capital, Domestic Savings and Economic Development," *Bulletin*, Oxford University, Institute of Economics and Statistics, May 1970.

9. ——————, and Enos, J. L., "Foreign Assistance: Objectives and Consequences," *Economic Development and Cultural Change*, April 1970.

10. Huq, Mahbubul, "Tied Credits—A Quantitative Analysis"—in J. Adler (ed.) *Capital Movements and Economic Development*, (Macmillan, 1967).

11. Islam, Nurul, "Foreign Assistance and Economic Development: The Case of Pakistan." *The Economic Journal*, March 1972 (Supplement).

12. Newlyn, W. T., "The Effect of Aid and Other Resource Transfers on Savings and Growth in Less-Developed Countries: A Comment," *The Economic Journal*, September 1973.

13. Papanek, G. F., "The Effect of Aid and Other Resource Transfers on Savings and Growth in Less Developed Countries," *The Economic Journal*, September 1972.

14. Planning Commission, Government of Pakistan, *Reports of the Advisory Panels for the Fourth Five Year Plan* (1970-75), Vol. I.

15. Qayum, A., "Long-Term Economic Criteria for Foreign Loans," *The Economic Journal*, June 1966.

16. Rahman, Anisur, "The Welfare Economics of Foreign Aid," *The Pakistan Development Review*, Vol. VII, No. 2, Summer 1967.

17. ————— , "Foreign Capital and Domestic Savings: A Test of Haavelmo's Hypothesis with Cross-Country Data," *Review of Economics and Statistics*, February 1968.

18. Rehman Sobhan, *Basic Democracies, Works Programme and Rural Development in East Pakistan*, Bureau of Economic Research, Dacca University, 1968.

19. Rosenstein Rodan, "International Aid for Underdeveloped Countries," *Review of Economics and Statistics*, May 1961.

20. Sengupta, A. K., "Foreign Capital Requirements for Economic Development," *Oxford Economic Papers*, March 1968.

21. Thomas, J., The Rural Works Programme and East Pakistan's Development, An unpublished Ph. D. thesis at the Harvard University, 1968.

22. Weisskopf, T., "The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries," *Journal of International Economics* Vol. 2, No. 1, February 1972.

Pattern of External Migration to and from Bangladesh, 1901—1961

by

Masihur Rahman Khan*

I. INTRODUCTION

The purpose of this paper is to obtain an estimate of the extent of migration across the border of Bangladesh over the period 1901-61 and to draw some inferences about its age-sex pattern. The study is limited to external migration between Bangladesh and the other countries of the Indian subcontinent. The estimates were primarily based on census data. Some PGE (Population Growth Estimation) data [16] were also used, especially for the purpose of life table construction for Bangladesh and Pakistan. The estimates of migration were obtained by two basic methods, viz., census survival method and lifetime migration method.[1] The former utilized age data and the latter birthplace data. The data on the distribution of population by religion and on displaced persons/ muhajirs[2] were also analysed to provide complementary information on migration. Section II is devoted to the data and their adjustments and section III to

---

*The author is a Research Demographer at the Bangladesh Institute of Development Studies. He acknowledges with thanks the comments on an earlier draft of this paper from Dr. Rafiqul Huda Chaudhury and Dr. Mohiuddin Alamgir, Research Demographer and Senior Research Economist respectively, of the Institute. This paper is based on the author's doctoral dissertation [10] presented to the Australian National University. The author gratefully acknowledges the valuable advice and criticism from Professors W. D. Borrie, C. A. Price, J. C. Caldwell and Dr. L. T. Ruzicka, of the Australian National University, and Professor K. G. Basavarajappa of the University of Western Ontario. He is also thankful to the Population Council, New York, for providing fellowship while conducting the study.

[1] These methods are discussed in the Appendix.

[2] Muhajirs in the 1951 census of *Pakistan* were those who came to *Pakistan* from India on account of the 1947 partition of the subcontinent or from fear of civil distrubances connected therewith [13, p.31]. Likewise, displaced persons in the 1951 census of India were those who came to India from *Pakistan* on account of the 1947 partition or fear of civil disturbances in that part [5, p. 1].

an analysis of the migration estimates. Some concluding remarks are presented in Section IV.

II. DATA AND THEIR ADJUSTMENTS

Census tabulations are made according to the territorial delineation current at the time of the census. Thus boundary changes over time, of the national and subnational units, make the census data on the size of the total population as well as its distribution by various characteristics noncomparable between censuses. In this study an attempt was made to make the total population, as well as its distribution by age, sex, birthplace, religion for each unit under study comparable over time. The adjusted data refer to the political delineation and nomenclature used in the 1961 censuses of India and *Pakistan*,[3] except that *Pakistan* is now divided into two sovereign countries, Bangladesh and Pakistan. We obtained external migration estimates between Bangladesh and the different zones of India. The different zones of India, as indentified for this study, are the following.

India East zone comprising West Bengal, Bihar, Orissa, Assam, Nagaland (excluding Tuensang district), Manipur, Tripura and Sikkim.

India North zone comprising Punjab (India), Rajasthan, Uttar Pradesh, Delhi and Himachal Pradesh.

India West, Central and South zone comprising Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh, Mysore, Madras, Kerala, Andaman and Nicobar Islands, Laccadive, Minicoy and Amindivi Islands, Goa, Daman and Diu, Pondichery, Dadra and Nagar Haveli.

The *Pakistan* censuses of 1951 and 1961 tabulated the origin of muhajirs in *Pakistan* who were born in India according to some zones in India. These zones, as identified in the *Pakistan* censuses, were not the same as those used in the Indian censuses of 1951 and 1961. The main consideration in grouping the areas in India into three zones as described above was to bring the definitions of zones

---

[3] In this study the name of a territorial unit referring to the old settings and boundaries, unless otherwise specifically spelt out, has been italicized.

used by the *Pakistan* and the Indian censuses as close as possible. From the 1961 area of India, the study excludes the Tuensang district of Nagaland, North East Frontier Agency and Jammu and Kashmir. The main reason for excluding these areas was that comparable population data for them were not available.

For the purposes of this study, in addition to the three zones of India, as has been defined, Bangladesh and Pakistan will be treated as two other separate zones.

Considerable changes took place in the territorial boundaries at the national and subnational levels since 1901 [10]. Thus, to mention changes involving the present area of Bangladesh, until the 1901 census, the provinces of *Bihar* and *Orissa* were parts of *Bengal Presidency*, *Assam* having a separate entity. In 1905 the *Bengal Presidency* was split and its eastern part together with *Assam* formed a new province of *Eastern Bengal and Assam*.[4] In 1912, the province of *Eastern Bengal and Assam* was annulled : *Assam* was separated out, and *Bengal*, *Bihar* and *Orissa* formed separate provinces. The 1947 partition of *India* involved the demarcation of boundaries of certain provinces and a new province of *East Bengal* (later renamed as *East Pakistan*) was drawn from the old provinces of *Bengal* and *Assam*, to form a part of the new country of *Pakistan*. Bangladesh, which secured its independence from *Pakistan* in 1971, has the same territorial unit as the old East Pakistan.

Furthermore, since 1947 there has been extensive reorganization of the territorial units in India through various legislations.[5] There has also been marked interdistrict readjustments of territories since 1901.[6]

The comparable total population over time for the years 1901 through 1961 for each unit of the study was obtained in two steps :

(1) Comparable figures for total population of each unit, as provided by the census authorities, were adopted.

---

[4] For a discussion on the 1905 partition of *Bengal* see [1, pp. 14-15].

[5] The details of these legislations and their application on the existing territorial units are available in various places. See especially [2, pp. 10-14 and 40-42; 6, pp. 47-49 and 92-105].

[6] In addition to the references on boundary changes in India cited above, notes on interdistrict territorial adjustments, especially for the period 1901-41, can be seen in [6, pp. 164-178]; also on the flyleaf to Tables I and II in the provincial and all *India* census tables.

(2) The population data adopted in step (1) were then subjected to adjustments for such causes of noncomparability as (a) inclusion of new areas under the census coverage, (b) very abnormal size of the total population as provided by the census authorities for some areas where census was not taken on a regular basis, (c) varying grouping of areas over time, (d) varying treatment of foreigners in the total population (e) artificial inflation in the reported population for some of the units in the 1941 census, and (f) non-synchronous dates of census taken in India and *Pakistan*.[7]

It may be mentioned here that it has been the census tradition in the undivided *India*, and also in the present India, to publish the total population by sex of the earlier censuses adjusted to the current district boundary. The 1951 census of *Pakistan* deviated slightly from this tradition in that it did not publish the sex breakdown of the adjusted population of the earlier censuses. The 1961 census of *Pakistan* did not even adjust the total population of the back censuses 1901-1941 for a number of districts that changed territorially after 1951. They have been discussed at length and comparable census population by sex was obtained separately [10, pp. 14—22, 324—329].

Having obtained the comparable total population, we were faced with the problem of obtaining comparable distribution of the total population by age. We separated out in this study the age data for Bangladesh as well as for Pakistan from the *Indian* censuses of 1901 through 1941. The problem was difficult because the age data in the old Indian censuses were published for Bangladesh region with other parts of the then undivided provinces of *Bengal* and *Assam*, for the Punjab (Pakistan) region with the undivided provinces of *Punjab* and *North West Frontier Province* in 1901 and with the old province of *Punjab* in 1911 through 1941, and for Sind region with the old province of *Bombay* in 1901 through 1931. However this problem was resolved by obtaining age and other data by districts. But here again there were many difficulties. There were several districts for which age data were not available for certain years because such districts were created at a later date. Some of these districts were created primarily from an old district, some others were created primarily from two or more

---

[7] For a detailed discussion of these problems and the method of adjustment for each, see [10, pp. 17-39].

districts. When a district was created primarily from an old unit, the observed *distribution* of the old unit was assumed to be the age *distribution* of the new district. When a district was created primarily from two or more districts/units, we first obtained what we call "derived" age data for the district.[8] The observed, assumed or derived age data for a district/unit were then inflated or deflated, as the case may be, by the ratio of the comparable total population (as previously determined) of the district/unit to the observed/assumed/derived total population of the district/unit.

As in the case of the districts/units in Bangladesh and Pakistan, we first obtained an appropriate set of observed age data for each zone of India, as defined in this study, and then adjusted the observed data of each zone to the comparable zonal population.

The observed age data of the India East zone for 1901, 1911, 1921 and 1931 were obtained by summing over the age data of all units comprising the zone including those of undivided *Assam* and *Bengal* and subtracting the age data for Bangladesh, as obtained in this study, for the respective census years. The same principle was observed in obtaining the age data for India North zone and India West, Central and South zone for the years 1901, 1911, 1921 and 1931.

In 1941 the age data collected through the census were only partially tabulated for the territorial units of India. However, after the partition of *India* in 1947, the census authorities of the present India published the age data of all the then Part A States[9] by single year age based on a 2% sample, according to the post-partition layout. The units for which such age data were available constituted 93.5% of the 1941 population of India.[10] We first grouped the single year age data in five years, as required for the study, for all units for which the age data were available. We then added the grouped age data for all the component units in each zone to obtain the observed zonal age data in 1941.

---

[8] For the details of the concept and definition of derived data and the procedure for obtaining them see [10, pp. 213-218].

[9] For details of the Part A States, see [2, Table A-1].

[10] For a discussion on the 1941 age data, see [4, pp. 1-2].

In 1951, the single year age data were avaialble for all persons, excluding displaced persons, on a 10% sample basis. The displaced persons were tabulated in complete counts. *Paper No. 3 of 1954, Age Tables - 1951 Census* [4], though publishing the graduated age data in both single year and five year groups for each unit in India, published the ungraduated data only in single years. We grouped the ungraduated single year sample age data in five years, multiplied each age group by 10, and added to each the displaced persons in the corresponding five year groups, separately for each unit. We then added the grouped age data, for the component units in each zone to obtain the observed age data for each zone in 1951.

In 1961, the single year age data were available for each unit in India. *Paper No. 2 of 1963, 1961 Census Age Tables* [8] published for each unit the graduated age data both in single year and five year groups, while the ungraduated data, as in 1951, only in single year. The ungraduated age data in five year groups were, however, published in the regular census volumes. Age data for each zone were obtained by aggregating the ungraduated age data in five year groups from all the component units in each zone in 1961.

The observed assumed derived age data for the various units and censuses were not comparable for (a) specific biases with the age recording/tabulation in certain years, (b) deliberate manipulation of the age data by the census authorities in a certain year, and (c) varying grouping of the age data. Each of these problems have been discussed at length and comparable age data, in five year age groups and sex, are obtained from [10, pp. 71-86].

The reported data by religion could not be compared between censuses, among other things, because of a change in the usual classification by religion to communities in 1941. In this study the data by religion for all censuses have been cast into a consistent classification as Muslims, Hindus, Sikhs, Buddhists, Jains, Parasees, Christians, Jews and other. Adjustments have been made to bring the 1941 community classification into a comparable form with the usual classification by religion in other censuses [10, pp. 213-222].

Unlike the data on age or religion which had to be adjusted one way only, i.e., for boundary changes in the place of enumeration, the birthplace data had to be adjusted two ways, i.e., both for boundary changes in the place of destination and in the place of origin.

The problem becomes complicated with the birthplace data, as in our case, when an old district/unit is split into two or more districts or when a district is created from two or more districts. A method was devised to tackle such problems. We also devised a basic algebra of adding and subtracting birthplace tabulations, and a method of allocating the birthplaces into *Pakistan* part and Indian part of an undivided province or state of those who were enumerated in a district/state but were tabulated as having been born in an undivided province or state outside the province or state of enumeration. Adjustments to obtain comparable birthplace data were made separately for migrants and non-migrants, and comparable birthplace data were obtained, first, for the districts in Bangladesh and Pakistan and, then, for the zones in India.[11]

III. MIGRATION ESTIMATES

While we obtained net migration estimates from the age data for all the intercensal periods 1901-11 through 1951-61, intercensal net migration estimates from the birthplace data could be obtained for Bangladesh and Pakistan for the decades 1901-11, 1911-21 and 1951-61, and for Bangladesh and India only for the decades 1901-11 and 1911-21. From the birthplace tabulations in India and *Pakistan*, coupled with the data on displaced persons muhajirs inferences can be drawn about the extent of migration between Bangladesh and India during 1951-61 and those associated with the 1947 partition of India. The data on religions provide useful complementary information concerning the migration associated with the partition and afterwards.

---

[11] For the details of the method of adjustment, see [10, pp. 134-150].

Migration between Bangladesh and India

Estimates of intercensal net external migration to Bangladesh from other regions of the subcontinent, as obtained from the age data, are summarized in Table I.

TABLE I

NET MIGRATION TO BANGLADESH FROM OTHER UNITS OF THE SUBCONTINENT

Persons	Decades					
	1901-11	1911-21	1921-31	1931-41	1941-51	1951-61
Both Sexes	174,188	-106,456	—643,193	—617,860	—1,892,062	—1,147,951
Males	96,468	66,641	-350,489	—330,189	—1,036,687	—623,874
Females	77,720	39,815	–292,704	—287,671	—855,375	—524,077

Source : Table A-13.

Since the net external migration between Bangladesh and Pakistan is very small[12] the estimate of net migration between Bangladesh and other regions of the subcontinent, as defined in this study and obtained from the age data, will in the main reflect the extent of net external migration between Bangladesh and India.

Except for the decade 1901-11 when Bangladesh received some net immigration from India, Bangladesh was losing to India all through. The net emigration

---

[12] Migration between Bangladesh and Pakistan was very small even after the creation of *Pakistan* in 1947. The number of lifetime migrants to Bangladesh from Pakistan was 805 in 1901, 1,031 in 1911, 577 in 1921, 9,389 in 1951 and 15,836 in 1961. The corresponding number of lifetime emigrants from Bangladesh region to Pakistan region was 1,269 in 1901, 461 in 1911, 3,084 in 1921, 6,012 in 1951 and 33,884 in 1961. Of the 15,836 lifetime immigrants in Bangladesh from Pakistan in 1961, 56.0% were from Punjab, 22.9% from NWFP, 18.2% from Sind and only 2.9% from Baluchistan. Of the 33,884 lifetime emigrants from Bangladesh to Pakistan, 67.7% were enumerated in Sind, 18.3% in Punjab and remaining 14.0% in NWFP and Baluchistan (Table A-3). During the intercensal period 1951-61, only 7,800 Pakistan-born persons migrated to Bangladesh and 28,700 Bangladesh-born persons migrated to Pakistan, so that net emigration from Bangladesh to Pakistan was only 20,900 persons (Table A-7).

from Bangladesh increased from around 100,000 in 1911-21 to around 600,000 in each of the decades 1921-31 and 1931-41, 1.9 million in 1941-51 and fell to 1.1 million in 1951-61 (Table I). This trend may possibly be due to high and increasing density of population and the consequent pressure on land, with no industrial development worth mentioning during the period.

The net immigration of about 174,000 people into Bangladesh during 1901-11, appears to be rather inconsistent with the findings for the following decades. However, this outcome can be attributed to the partition of *Bengal* in 1905. The partition released a number of socio-economic forces which caused an increased movement of population toward the present region of Bangladesh. The primary manifestation of these forces was in the form of a shift of the centre of administrative, political and economic activities to Dacca from Calcutta which was the traditional nerve centre of all types of activities in this region.

With the annulment of the partition of *Bengal* in 1912 the pattern of net migration was reversed. As pointed out above, more people moved out of Bangladesh than came into it. This flow could be explained by the interaction of economic forms such as lack of economic opportunities within Bangladesh and the emergence of industrial/commercial centres in the eastern zone of India which held out prospect of employment opportunities. However, in some decades the rate and the pattern of net migration were influenced by extreneous factors, such as, the influenza epidemic of 1918—19, the *Bengal* famine of 1943 and the partition of India in 1947. The influenza epidemic seem to have caused a lower rate of net migration during 1911-21 in the whole subcontinent compared with the other decades. As can be seen from Table I, the figure for net migration from Bangladesh during this decade was the lowest (106, 456) among all decades between 1911 and 1961.

As mentioned above, the net migration from Bangladesh during 1941-51 was influenced a great deal by, among other things, the 1943 *Bengal* famine and the partition of *India* in 1947. In the wake of the partition, over seven million persons moved each way—Muslims leaving India for *Pakist..n* and Hindus living *Pakistan* for India. During the period 1941-51, Bangladesh lost around 2.5 million Hindus to India and gained around 0.7 million Muslims from India, so that the net emigration from Banagladesh was around 1.8 million persons (see

Tables A-9 through A-12). Due to the exchange of population, the proportion of Hindus to total population decreased from 29.16% in 1941 to 22.05% in 1951, and for the corresponding period the proportion of Muslims increased from 69.96% to 76.82% (Table A-12) in Bangladesh. The exchange of population due to the 1947 partition was basically family-wise, though the children and females were represented less among the migrants than the non-migrants.[13]

The emigration of Hindus from Bangladesh continued during the 1951-61 decade, though at a lower rate than the preceding decade. During the 1951-61 decade Bangladesh lost a net of around 1.1 million Hindus to India (see Tables A-6 and A-12). There does not seem to be any net movement of the Muslims across the borders of Bangladesh and India during this decade.

Age Sex Patterns of Migrants

In the long distance interzonal migration in the subcontinent, excepting the family-wise migration in the wake of partition, the males far out-numbered the females. Though there were always some variations in the magnitude of the sex differentials of migrants in the individual cases at a particular census and over time, this general relationship between the sexes of migrants and the distance between place of origin and place of destination is tenable both in the case of life-time and intercensal migrants.

In the pre-partition days, the emigration from Bangladesh to West Bengal was largely male dominated, while the flow in the other direction, i.e., immigration to Bangladesh was smaller in size and more balanced in its sex composition.

Though the age patterns of net migration between Bangladesh and other units of the subcontinent, as have been obtained in this study, are by no means regular, they do provide some useful information on the age patterns of net migration (Table A-13).

The age pattern of net female migration to and from Bangladesh in pre-partition days also seems to prevail during the 1941-51 intercensal period, except that

---

[13] Tables are not shown here. For a discussion on the age sex composition of displaced persons and muhajirs see [10, pp. 235-239].

during this decade return migration in the old ages was quite pronounced. During the 1951-61 intercensal period, Bangladesh witnessed net outward migration almost in all age groups, and the net outward migration of females of the age group 15-34 was quite high.

During the pre-partition days, Bangladesh region seems to have lost males through net emigration mainly in the age groups of 15-24 and 45 and over, and gained net immigration of males mainly in the age group of 25-39. The net immigration of males in the age range of 25-39 was particularly noticeable during the first two decades of the present century, it was low during the 1921-31 decade and was about nil during the 1931-41 decade. The net immigration of males in the age group of 25-39 is interesting, especially because there was a net emigration of females of the corresponding age group. The net immigration of males in the age group 25-39 particularly during the earlier decades was, however, matched by a net immigration of females of about 10 years younger, i.e., mainly in the age group 15-29. During the decades 1941-51 and 1951-61 Bangladesh lost through net emigration of males and females in almost all ages. The net emigration of males was particularly high in the age groups 15-34 in both the decades.

Effect of External Migration on the Growth Rate of the Population

In this section we will limit our discussion to the immediate effect of external migration on the growth of the population of Bangladesh, not considering the contribution of the progeny of the migrants to the growth of population.

The population of Bangladesh registered an increase from 28.93 million in 1901 to 50.85 million in 1961 representing growth of 75.8%. This compares with a growth rate of 86.6% in the whole of the subcontinent of Bangladesh, India and Pakistan, 84.0% in India and 138.0% in Pakistan during 1901-61, based on comparable population. While the growth of the population in the whole of the subcontinent, as well as in India, reflects basically the growth due to the balance between births and deaths of the population, the growth of the population of Bangladesh was also affected substantially by net outward migration during the period beginning with 1911.

The Bangladesh population was being depleted through net external migration since 1911. The amount and rate of intercensal net outward migration

TABLE II

CONTRIBUTION OF NET MIGRATION IN THE GROWTH OF THE POPULATION OF BANGLADESH, 1901-11 THROUGH 1951-61

Components	Decades					
	1901-11	1911-21	1921-31	1931-41	1941-51	1951-61
All components	2,627,270	1,699,040	2,350,074	5,046,856	1,441,584	8,791,111
Net migration	174,188	—106,456	—643,193	—617,860	—1,892,062	—1,147,951
Natural increase	1,453,082	1,805,496	2,993,267	5,664,716	3,303,646	9,939,062
			Rate*			
All components	8.69	5.24	6.83	13.24	3.41	18.92
Net migration	0.58	—0.33	—1.87	—1.62	—4.57	—2.47
Natural increase	8.11	5.57	8.69	14.86	7.99	21.39

* The rate is obtained as a percentage of the average intercensal population.

were especially high during the decades 1941-51 and 1951-61. During the 1941-51 decade, of the 3.3 million natural increase, 1.9 million was depleted through net emigration, so that the balance of population increase was only 3.41% of the average intercensal population. During the next decade of 1951-61, of the 9.9 million natural increase representing 21.39% of the average intercensal population, 1.1 million or 11.5% of the natural increase of the population was depleted through net emigration, so that the actual increase of the population was 8.8 million or 18.92% of the average intercensal population.

IV. CONCLUSION

In the absence of the basic knowledge of the extent and pattern of migration, even in some of the major studies based on the stable and quasi-stable techniques of estimating vital rates from the age data and intercensal growth rates of the population, it was assumed that the populations of Bangladesh and Pakistan, taken seperately, were closed to external migration [11, 17, 21]. The assumption of a closed population was not tenable for the then *Pakistan*, not to speak of the present Bangladesh and Pakistan, taken separately. Given the findings of the study, it is no wonder that the estimates from the stable and quasi-stable population models for all *Pakistan*, and for Bangladesh and present Pakistan, taken separately, were erratic.

Mention may be made of the claim made by the Census Commissioner of India that there was a considerable immigration of Muslims from Bangladesh to India during the 1951-61 decade [7, p. xxxiv]. His claim was based on the observation that the Muslims in Assam, West Bengal, Tripura and some parts of Bihar registered a rapid rate of increase during the decade. He, however, ignored the fact that there was no unusual rate of increase of Muslims in India during the 1951-61 decade[14] and that the reported high rate of increase of the Muslims in the areas bordering Bangladesh (also Pakistan) was in the main a function of redistribution of Muslims within India; the possibility of underenumeration of the Muslims in 1951, especially in the areas bordering Bangladesh cannot also be ruled out. His contention that in the absence of emigration, the Muslims in Bangladesh during the decade would have increased by 30% is not more than a mere assertion, as is the claim made by the Census Commissioner of *Pakistan* that there was a net immigration of 0.8 million persons to *Pakistan* from India during the 1951-61 intercensal period [14, pp. II-3-5]. During the 1951-61 intercensal period, the then West Pakistan received net immigration of only a small size of around 12,000 persons from India, so that the net emigration from the then *Pakistan* to India during the decade stood at 1.1 million persons. Visaria came up with a somewhat reasonable estimate of net migration between *Pakistan*

---

[14] During the 1951-61 decade, Muslims in India registered an increase of 24.72% in the comparable area, as compared to 26.93% increase in Bangladesh.

and India during the 1951-61 decade by using official statistics of the Government of India [19, pp. 323-334]. Visaria's estimate of 1.24 million (average of 1.16 and 1.32 millions) net emigration from Pakistan compares with the present estimate of 1.1 million. The assumed mortality difference in the two studies may explain the difference.

Due to lack of data, many of the detailed reasons for migration and of the observed age sex patterns of the migrants remain unexplored. Nor one could say anything about the interrelationship of migration and the fertility and mortality of the population. Specialized sample surveys can provide useful complementary information for such undertakings.

Appendix

METHOD OF NET MIGRATION ESTIMATES

Two basic methods, viz., the census survival method and the lifetime migration method are used for the estimation of migration in this study.

Census Survival Method

Census survival method accommodates for certain errors in the age sex data, in obtaining net migration estimates from the age data. Because of a high degree of misstatement of age [10, pp. 50-62], the age data were first graduated according to a method called the $[\frac{1}{4}, \frac{1}{2}, \frac{1}{4}]$ formula [17, p. 36; 19, pp. 150-151]. This formula is employed to remove most of the irregularities in the age data due to age misreporting, but at the same time, retain the underlying basic age pattern of the original data. The census survival method is based on certain assumptions and the reliability of the estimates depends on the extent to which the assumptions hold good. To reduce the error due to the non-fulfilment of the condition that the population is closed to external migration, we used the overall census survival ratio of the subcontinent of Bangladesh, India and Pakistan, instead of Bangladesh alone. As the mortality in the subcontinent was very high, especially in the early decades and the level and pattern of mortality in each zone of the subcontinent were different,[1] we had to make adjustments for mortality differences among the zones. This was done in two steps: (1) for the differences in the "normal" mortality obtained from the "normal" life tables[2] and (2) for the differences in the 1918/19 influenza deaths and 1943 *Bengal* famine deaths. We

---

[1] Life tables were constructed for each zone of the subcontinent and for each intercensal period, 1901-11 through 1951-61, by sex. For details of the mortality and life tables see [10, pp. 104-113 and 330-336].

[2] The life tables, as were prepared by the Indian census actuaries, were based on the census age data adjusted for internal migration. In constructing the life tables, age sex data were also adjusted to take out the effect of large scale famines and epidemics, so that the life tables would reflect the level and pattern of mortality that were expected to prevail in "normal" times when the death rate was neither exceptionally high nor low [9].

did not have enough information on the degree of completeness of enumeration in each age group and sex at the beginning and end of the intercensal period, and hence no special adjustment on this account was made. The 1951 census of *Pakistan*, however, suffered from an undercount of the population and adjustment was made for this factor in the net migration estimate. The basic formula for net migration estimate from the age data is given below:

$$N_i = P_i^2 - (P_i^1)\left(\frac{P_c^2}{P_c^1}\right)\left(\frac{\text{rltsr}}{\text{cltsr}}\right)$$

where N_i is the net migration estimate for an age group and sex for the ith unit during an intercensal period; P_i^1 and P_c^1 refer to the population in an age group and sex in the ith unit and in the subcontinent, respectively, at the initial year of an intercensal period; P_i^2 and P_c^2 are the corresponding population ten years older at the terminal census of the intercensal period; rltsr is the zonal life table survival ratio for an age group and sex during an intercensal period and is obtained from the intercensal life table for a zone as $5^{L}x+10/5^{L}x$; similarly cltsr is the subcontinental life tables survival ratio for an age group and sex during an intercensal period and is obtained from an intercensal life table for the subcontinent as $5^{L}x+10/5Lx$.

In the formula above, $(P_i^1)\left(\frac{P_c^2}{P_c^1}\right)$ is the expected population for an age group and sex in the ith unit at the terminal census of the intercensal period, without migration and without adjustment for mortality differences among the zones ; $N_i' = P_i^2 - (P_i^1)\left(\frac{P_c^2}{P_c^1}\right)$ can be designated as net migration estimate without adjustment for mortality differences among the zones; and the whole formula of N_i which takes into account of mortality differences among the zones can be re-written as

$$N_i = N_i' + (P_i^1)\left(\frac{P_c^2}{P_c^1}\right)\left(1 - \frac{\text{rltsr}}{\text{cltsr}}\right).$$

The above formula can obtain net migration estimates for persons ten years and over. The estimates of net migration under age 10 were obtained from the estimates of intercensal net migration as obtained above, on the assumption of an even flow of migrants throughout the intercensal period and a child-women ratio of the migrant women same as that of all women in the unit.

Lifetime Migration Method

Lifetime migration data from the censuses have been utilized to obtain estimates of intercensal net migration. Lifetime migrants, as tabulated for the districts of a province, are those enumerated in a district but born in other districts within the province and in other provinces/units in the subcontinent. They are called lifetime migrants, as opposed to say intercensal migrants, because the actual act of their migration into the place of destination is with reference to no fixed time period (say, an intercensal period, last 1 year, last 5 years etc.) but any time during the life time of each. They are of a stock nature as they show the total number of migrants in an area at a point of time—the reference date of a census. They are converted into estimates of a flow nature, as intercensal migrants, by differentiating their numbers at the two successive censuses, having taken into account of mortality of the lifetime migrants during the intercensal period as under:

$$N=(I_2-S_1I_1)-(O_2-S_0O_1)$$

$$=I_2-O_2-S(I_1-O_1) \quad [\text{if } S_1=S_0]$$

where N is the estimate of intercensal net migration for a unit, I_1 and I_2 are the lifetime inward-migrants to the unit at the initial and terminal censuses of an intercensal period, respectively; 0_1 and 0_2 are the corresponding outward-migrants from the unit; S_1 and S_0 are the survival ratios of the lifetime inward-migrants to and outward-migrants from the unit, respectively. S_1 or S_0 for a zone was assumed same as the overall census survival ratio of the subcontinent adjusted by the ratio of the zonal overall survival ratio to the subcontinental overall survival ratio. Separate adjustment was also made for incorporating the effects of 1918–19 influenza deaths in the survival ratios for the 1911-21 decade.[3]

---

[3] Since no estimate of net migration by the lifetime migration method could be obtained for the intercensal period of 1941-51, it was not necessary to construct the overall survival ratios for the 1941-51 intercensal period by incorporating the effect of the 1943 *Bengal* famine.

Estimates of intercensal net migration as have been obtained by each of the methods of census survival and lifetime migration refer to the net balance of in-born persons outward migrating and out-born persons inward migrating during the intercensal period, ignoring all multiple and circular moves of a person within the intercensal period. Return moves are not counted, nor are counted moves of those who had migrated into an area but died before the end of the intercensal period. Migration estimates are obtained under both methods, with reference to persons alive at the time of and enumerated in the census. Both the methods utilized comparable census data and the estimates obtained by the two methods are comparable when they pertain to the same territorial units and coverage.

It may, however, be noted that estimates obtained by using census survival method can only indicate the extent of intercensal net migration between a unit and all other units taken together of the subcontinent. Under this method the numbers of in-born persons outward migrating and out-born persons inward-migrating cannot be separately known, nor can we identify the migration streams. The method can, however, provides age sex breakdown of the net migration so defined. Lifetime migration estimates, on the other hand, is useful in providing inferences about the distance and flow of migration, separately for inward migrants and outward migrants.

The net migration estimates from the age data indicate the extent of net migration between Bangladesh and all other units of the subcontinent. Similar estimate, as has been obtained from the birthplace data, will be given by adding the net migration between Bangladesh and Pakistan and the net migration between Bangladesh and India. These two sets of estimates pertaining to the same territorial coverage, as could be obtained for the decades of 1901-11 and 1911-21 only, are given below :

INTERCENSAL NET MIGRATION TO BAGLADESH FROM OTHER UNITS IN THE SUBCONTINENT AS OBTAINED BY THE CENSUS SURVIVAL METHOD AND LIFE-TIME MIGRATION METHOD, 1901-11 AND 1911-21 BY SEX

Decades & Sex		Intercensal Net Migration Estimates	
		Census Survival Method	Lifetime Migration Method
1901-11	Both Sexes	174,188	139,683
	Males	96,468	82,666
	Females	77,720	57,017
1911-21	Both Sexes	—106,456	—140,448
	Males	—66,641	—99,157
	Females	—39,815	—41,291

Source : Tables A-5, A-7 and A-13.

In view of the generally poor quality of the basic data used, the agreement in the estimates from the two methods may be considered reasonable. A strict non-correspondence between the two estimates could be due to the difference in the accuracy of the two sets of data used and the difference in the method of mortality adjustment.

Appendix

TABLE A-1

LIFETIME EXTERNAL MIGRATION BETWEEN BANGLADESH AND INDIA, 1901, 1911 AND 1921, BY SEX

Zones of India	Lifetime Immigration to Bangladesh			Lifetime Emigration from Bangladesh		
	Both Sexes	Males	Females	Both Sexes	Males	Females
			1901			
All India	575,816	377,700	198,116	499,167	274,303	224,864
India East	401,269	262,330	138,939	417,122	242,017	175,105
India North	147,479	101,566	45,913	54,211	17,906	36,305
India W. C. & South	27,068	13,804	13,264	27,834	14,380	13,454
			1911			
All India	740,883	493,330	247,553	541,679	330,187	211,492
India East	540,052	358,505	181,547	510,144	311,856	198,288
India North	177,232	122,987	54,245	18,020	9,357	8,663
India W. C. & South	23,599	11,838	11,761	13,515	8,974	4,541
			1921			
All India	633,236	409,700	223,536	623,872	385,489	238,383
India East	464,935	300,916	164,019	599,316	368,838	230,478
India North	136,419	93,034	43,385	15,727	9,616	6,111
India W. C. & South	31,882	15,750	16,132	8,829	7,035	1,794

TABLE A-2

LIFETIME IMMIGRANTS TO BANGLADESH FROM INDIA 1951 AND 1961

Zones of India	1951	1961
All India	847,987	627,389
India East	795,143	553,772
India North	41,795	43,388
India W. C. & South	10,870	27,561
India Unspecified	179	2,668

TABLE A-3

LIFETIME EXTERNAL MIGRATION BETWEEN BANGLADESH AND PAKISTAN, 1901, 1911, 1921, 1951 AND 1961, BY SEX

Pakistan Provinces	Lifetime Immigration to Bangladesh			Lifetime Emigration from Bangladesh		
	Both Sexes	Males	Females	Both Sexes	Males	Females
1901						
All Pakistan	805	670	135	1,269	766	503
Punjab & NWFP	724	608	116	1,070	642	428
Baluchistan	36	30	6	55	35	20
Sind	45	32	13	144	89	55
1911						
All Pakistan	1,031	778	253	461	314	147
Punjab	849	633	216	149	103	46
Baluchistan	3	1	2	79	53	26
Sind	118	94	24	72	61	11
NWFP	61	50	11	161	97	64
1921						
All Pakistan	577	416	161	3,084	2,470	614
Punjab	195	106	89	894	563	331
Baluchistan	14	12	2	295	228	67
Sind	186	128	58	1,407	1,299	108
NWFP	182	170	12	488	380	108
1951*						
All Pakistan	9,389	—	—	6,012	—	—
Punjab	6,983	—	—	1,464	—	—
Baluchistan	68	—	—	463	—	—
Sind	554	—	—	3,125	—	—
NWFP	1,784	—	—	960	—	—
1961						
All Pakistan	15,836	12,461	3,375	33,884	24,627	9,257
Punjab	8,867	7,300	1,567	6,217	4,213	2,004
Baluchistan	465	326	139	1,163	939	224
Sind	2,879	1,747	1,132	22,954	16,877	6,077
NWFP	3,625	3,088	537	3,550	2,598	952

* Sex breakdown of the lifetime migration could not be obtained.

TABLE A-4

LIFETIME EXTERNAL MIGRATION BETWEEN BANGLADESH AND WEST BENGAL, 1901, 1911 AND 1921, BY SEX

Year	Lifetime Immigration to Bangladesh			Lifetime Emigration from Bangladesh		
	Both Sexes	Males	Females	Both Sexes	Males	Females
1901	134,971	71,994	62,977	183,715	116,476	67,239
1911	152,233	77,869	74,364	222,793	137,557	85,236
1921	144,523	72,641	71,882	253,113	159,061	94,052

TABLE A-5

INTERCENSAL EXTERNAL MIGRATION BETWEEN BAGLADESH AND INDIA, 1901—11 AND 1911—21, BY SEX

Zones of India	1901—11			1911—21		
	Immigration to Bangladesh	Emigration from Bangladesh	Net External Migration	Immigration to Bangladesh	Emigration from Bangladesh	Net External Migration
All India						
Both Sexes	292,591	153,832	138,759	89,612	227,114	—137,502
Males	197,392	115,264	82,128	43,940	140,685	—96,745
Females	95,199	38,568	56,631	45,672	86,429	—40,757
India East						
Both Sexes	227,663	185,858	41,805	68,695	225,634	—156,939
Males	152,962	122,229	30,733	35,116	137,624	—102,508
Females	74,701	63,629	11,072	33,579	88,010	—54,431
India North						
Both Sexes	62,344	—23,928	86,272	6,261	2,566	3,695
Males	43,407	—4,672	48,079	1,850	2,679	—829
Females	18,937	—19,256	38,193	4,411	—113	4,524
India W. C. & South						
Both Sexes	2,584	—8,098	10,682	14,656	—1,086	15,742
Males	1,023	—2,293	3,316	6,974	382	6,592
Females	1,561	—5,805	7,366	7,682	—1,468	9,150

TABLE A-6

INTERCENSAL NET EMIGRATION OF *PAKISTAN*-BORN PERSONS TO INDIA ZONES, 1951-61

India Zones	Net Emigration		
	Both Sexes	Males	Females
All India	1,200,693	566,448	634,245
India East	1,127,784	596,967	530,817
India North	6,357	—52,931	59,288
India W. C. & South	66,552	22,412	44,140

TABLE A-7

INTERCENSAL NET EXTERNAL MIGRATION BETWEEN BANGLADESH AND PAKISTAN, 1901—11, 1911—21 AND 1951—61

Pakistan	Immigration to Bangladesh			Emigration from Bangladesh			Net External Migration		
	Both Sexes	Males	Females	Both Sexes	Males	Females	Both Sexes	Males	Females
				1901—11					
All Pakistan	414	261	153	—510	—277	—233	924	538	386
Punjab and NWFP	353	213	140	—510	—296	—214	863	509	354
Baluchistan	—24	—22	—2	37	26	11	—61	—48	—13
Sind	85	70	15	—37	—7	—30	122	77	45
				1911—21					
All Pakistan	—213	—184	—29	2,733	2,228	505	—2,946	—2,412	—534
Punjab	—458	—384	—74	781	484	297	—1,239	—868	—371
Baluchistan	13	12	1	235	187	48	—222	—175	—47
Sind	96	56	40	1,352	1,252	100	—1,256	—1,196	—60
NWFP	136	132	4	365	305	60	—229	—173	—56
				1951—61*					
All Pakistan	7,774	—	—	28,722	—	—	—20,948	—	—
Punjab	2,871	—	—	4,960	—	—	—2,089	—	—
Baluchistan	407	—	—	765	—	—	—358	—	—
Sind	2,403	—	—	20,271	—	—	—17,868	—	—
NWFP	2,093	—	—	2,726	—	—	—633	—	—

*The sex breakdown of the intercensal migration could not be obtained.

TABLE A-8

NET EXTERNAL MIGRATION FROM WEST BENGAL TO BANGLADESH, 1901-11 AND 1911-21

Persons	Intercensal External Migration		
	Immigration from West Bengal	Emigration to West Bengal	Net External Migration
	1901—11		
Both Sexes	48,539	81,313	—32,774
Males	21,947	47,081	—25,134
Females	26,592	34,232	—7,640
	1911—21		
Both Sexes	30,152	85,353	—55,201
Males	13,524	54,634	—41,110
Females	16,628	30,719	—14,091

TABLE A-9

MUHAJIRS IN BANGLADESH FROM INDIA ZONES, 1951

India Zones	Muhajirs	
	Number	Percentage
All India	699,079	100.00
India East	670,735	95.95
India North	22,782	3.26
India W. C. & South	5,534	0.79
Not Specified	28	...

TABLE A-10

DISPLACED PERSONS IN INDIA ZONES FROM BANGLADESH, 1951

India Zones	Displaced Persons	
	Number	Percentage
All India	2,549,390	100.00
India East	2,523,115	98.97
India North	16,926	0.66
India W. C. & South	9,349	0.37

TABLE A-11

TRANSFER OF POPULATION FROM BANGLADESH TO INDIA DUE TO THE 1947 PARTITION, BY SEX, 1951

Category	Number of Persons		
	Both Sexes	Males	Females
1. Muhajirs in Bangladesh from India, 1951	699,079	382,393	316,686
2. Displaced Persons from Bangladesh in India, 1951	2,549,390	1,363,805	1,185,585
3. Net Transfer from Bangladesh to India 1951 (Item 2—Item 1)	1,850,311	981,412	868,899

TABLE A-12

COMPARABLE RELIGIOUS DATA FOR BANGLADESH, 1901—1961 AND THEIR INCREASE

Religions	Number of Persons*						
	1901	1911	1921	1931	1941	1951	1961
All religions	28,927,786	31,555,056	33,254,096	35,604,170	40,651,026	41,932,329	50,840,235
Muslims	19,033,616	21,174,298	22,624,967	24,655,296	28,441,462	32,214,155	40,890,481
Parsees	5	25	39	50	294	116	193
Christians	34,350	42,555	52,277	66,501	92,855	106,776	148,903
Jews	15	29	27	7	40	a	a
Hindus	9,600,892	9,953,314	10,166,781	10,504,569	11,854,948	9,244,342	9,379,669
Sikhs	5	190	225	358	1,279	a	a
Buddhists	163,211	188,438	210,426	252,647	111,984	326,185	373,867
Jains	2,340	2,669	4,613	3,402	2,226	a	a
Others	93,354	193,537	194,736	121,340	145,938	40,757	47,122
Numerically Major Religions	Percentage Increase						
	1901—11	1911—21	1921—31	1931—41	1941—51	1951—61	1901—61
All religions	9.08	5.38	7.07	14.17	3.15	21.24	75.75
Muslims	11.25	6.85	8.97	15.36	13.26	26.93	114.83
Hindus	3.67	2.14	3.32	12.86	—22.02	1.46	—2.30

* While the population for 1911-1941 includes foreigners, that for 1951-1961 does not include them.

[a] Jews, Sikhs and Jains, if any, are included in "others."

TABLE A-13

INTERCENSAL NET EXTERNAL MIGRATION BETWEEN BANGLADESH AND OTHER UNITS OF THE SUBCONTINENT, 1901-11 THROUGH 1951-61, BY AGE GROUPS AND SEX, AS OBTAINED FROM THE AGE DATA

Age	Net External Migration*			Net External Migration*		
	Both Sexes	Males	Females	Both Sexes	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		1901—11			1911—21	
All ages	174,188	96,468	77,720	-106,456	—66,641	—39,815
0—9	-16,351	-7,732	-8,619	4,974	2,490	2,484
10—14	90,323	18,729	71,594	—8,154	21,393	—29,547
15—19	20,987	-73,256	94,243	-51,520	—64,633	13,113
20—24	112,602	-7,711	120,313	-11,892	—42,930	31,038
25—29	89,024	73,508	15,516	21,495	20,454	1,041
30—34	17,139	59,681	—42,542	23,454	41,998	—18,544
35—39	—16,723	31,069	—47,792	8,925	16,954	—8,029
40—44	—83,391	—4,364	—79,027	—3,937	919	—4,856
45—49	88,019	27,034	60,985	12,894	8,487	4,407
50—54	25,646	16,920	8,726	18,205	15,584	2,621

(Contd.)

TABLE A-13 (Contd.)

Age	Net External Migration*			Net External Migration*		
	Both Sexes	Males	Females	Both Sexes	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)
55—59	11,812	2,398	9,414	—15,046	—12,562	—2,484
60—64	24,023	15,360	8,663	—20,339	—14,217	—6,122
65—69	37,439	23,434	14,005	—13,576	—8,619	—4,957
70 +	969	9,306	—8,337	—9,741	—3,817	—5,924
		1921—31			1931—41	
All ages	—643,193	—350,489	—292,704	—617,860	—330,189	—287,671
0—9	—101,152	—53,237	—47,915	—106,324	—56,256	—50,068
10—14	138,285	—73,626	—64,659	—8,903	—1,841	—7,062
15—19	—39,158	—93,397	54,239	51,188	—30,790	81,978
20—24	55,187	—48,086	103,273	160,955	2,168	158,787
25—29	—76,922	—9,918	—67,004	—26,609	—1,876	—24,733

(Contd.)

TABLE A-13 (Contd.)

Age	Net External Migration*			Net External Migration*		
	Both Sexes	Males	Females	Both Sexes	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)
30—34	—152,931	13,300	—116,231	—153,919	544	—154,463
35—39	—50,372	22,745	—73,117	—98,782	1,395	—100,177
40—44	—6,883	2,687	—9,570	—93,451	—36,312	—57,139
45—49	—18,772	—26,793	8,021	—97,344	—62,763	—34,581
50—54	—26,475	—34,609	8,134	—74,834	—55,212	—19,622
55—59	—15,469	—17,934	2,465	—47,231	—30,967	—16,264
60—64	—24,854	—13,216	—11,638	—54,928	—27,018	—27,910
65—69	—20,729	—7,798	—12,931	—43,495	—21,891	21,604
70+	—26,378	—10,607	—15,771	—24,183	—9,370	—14,813
		1941—51			1951—61	
All ages	—1,892,062	—1,036,687	—855,375	—1,147,951	—623,874	—524,077
0— 9	—59,044	—25,452	—33,592	—326,255	—165,485	—160,770
10—14	93,924	51,886	42,038	217,138	174,729	42,409
15—19	—34,246	—78,013	43,767	—351,421	—232,833	—118,588
20—24	—118,296	—138,400	20,104	—250,434	—221,270	—29,164
25—29	—478,035	—257,380	—220,655	—225,352	—153,127	—72,225

(Contd.)

TABLE A-13 (Contd.)

Age	Net External Migration*			Net External Migration*		
	Both Sexes	Males	Females	Both Sexes	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)
30—34	—595,270	—251,290	—343,980	—157,551	—54,641	—102,910
35—39	—420,364	—184,803	—235,561	—30,436	22,087	—52,523
40—44	—275,953	—141,383	—134,570	—62,786	—19,091	—43,695
45—49	—148,084	—74,212	—73,872	—90,696	—15,470	—39,226
50—54	—11,988	—14,925	2,937	—34,968	—22,067	—12,901
55—59	—1,907	—12,432	10,525	—56,389	—29,366	—27,023
60—64	3,383	—5,998	9,381	—83,426	—27,436	—55,990
65—69	41,643	20,363	21,280	85,691	53,116	32,575
70+	112,175	75,352	36,823	218,934	102,980	115,954

(Concld.)

*While the figures with a negative sign indicate net emigration from Bangladesh, those without a sign indicate net immigration to Bangladesh.

REFERENCES

1. India, Census of India, 1911, Vol. I, *India*, Part I, *Report.*
2. India, Census of India, 1951, Vol. I, *India*, Part II-A, *Demographic Tables.*
3. India, Census of India, 1951, Vol. XII, *Assam, Manipur and Tripura*, Part I-A, *Report.*
4. India, Census of India, 1951, Paper No. 3 of 1954, *Age Table · 1951 Census.*
5. India, Census of India, 1951, Paper No. 4 of 1954, *Displaced Persons.*
6. India, Census of India, 1961, Vol. I, *India*, Part II-A (i), *General Population Tables.*
7. India, Census of India, 1961, Paper No. 1 of 1963, *Religion.*
8. India, Census of India, 1961, Paper No. 2 of 1963, *1961 Census Age Tables.*
9. India, Office of the Registrar General of India, *Actuarial Reports for the Censuses 1881, 1901, 1911, 1921, 1931 and 1951* (Reprint), Delhi, 1960.
10. Khan, Masihur Rahman, *Migration Within and Across and Boundaries of East and West Pakistan, 1901-61*, a thesis presented for the degree of Ph. D. at the Australian National University, Canberra, 1972.
11. Krotki, Karol J., "Population Size, Growth and Age Distribution: Fourth Release from the 1961 Census of Pakistan," *Pakistan Development Review*, Vol. III, No. 2, Summer 1963, pp. 279-305.
12. Mauldin, W. P. and Sultan S. Hashmi, "Illustrative Eastimates and Projections of the Population of Pakistan, 1951 to 1991" in L. M. Qureshi (ed.), *Population Growth and Economic Development*, Karachi: Pakistan Institute of Development Economics, 1960.
13. Pakistan, Census of Pakistan, 1951, Vol. 1, *Pakistan.*
14. Pakistan, Census of Pakistan, 1961, Vol. 1, *Pakistan.*

15. Pakistan, Census of Pakistan, 1961, Vol. 2, *East Pakistan.*

16. Population Growth Estimation, *Report of the Population Growth Estimation*, Karachi, Pakistan Institute of Development Economics, 1968.

17. Robinson, W. C. William Seltzer and Sultan S. Hashmi, "Quasi-stable Estimates of Vital Rates of Pakistan," *Pakistan Development Review*, Vol. V, No. 4, Winter 1965, pp. 638-658.

18. United Nations, Department of Social Affairs, *Methods of Measuring Internal Migration* (Population Studies No. 47), New York, 1970.

19. Visaria, Pravin M., "Migration between India and Pakistan, 1951-61," *Demography*. Vol. 6, No. 3, August 1969, pp. 323-334.

20. Zachariah, K. C., *A Historical Study of Internal Migration in the Indian Sub-continent, 1901-1931*, Bombay: Asia Publishing House, 1964.

21. Zelnik, Melvin and Masihur Rahman Khan, "An Estimate of the Birth Rate in East and West Pakistan," *Pakistan Development Review*, Vol. V, No. 1, Spring 1965, pp. 64-93.

Note

The General Problem of Industrial Concentration and Industrial Economic Power in Less Developed Countries*

by

LAWRENCE J. WHITE**

Studies of industrial organization have traditionally confined themselves to the advanced countries of the West. This is not surprising, since, until recently, this is where virtually all of the industry was. As less developed countries (LDC's) have created fledgling industrial structures, the concepts of industrial organization have become relevant for these countries. Yet, only Bain (1966) and Merhav (1969) have attempted general industrial organization approaches that deal with LDC's. It is the major thesis of this article that industrial organization tools provide a useful framework for analyzing an important set of LDC problems.

Defining Terms

By "industrial concentration," I mean some measure of the number and or relative sizes of firms within a single reasonably well defined industry or market. An industry with high concentration would be one in which a few firms controlled a large percentage of the economic activity in that industry. The fewer are the firms in the industry and the more openly and easily they can coordinate their actions, the more likely they are to achieve results similar to those of a monopoly (Chamberlin, 1962; Fellner, 1949). In the pages that follow, my references to "monopoly" will also mean oligopolies which can coordinate well enough so as to approximate monopoly results.

---

* This is part of a larger study of industrial concentration and industrial economic power in Pakistan soon to be published by Princeton University Press. The American Council of Learned Societies provided financial support for this study, for which I offer grateful acknowledgement. I want to thank Shane Hunt, Stephen R. Lewis, Jr., Lester Gordon, Edward S. Mason, and Gordon C. Winston for their comments on earlier drafts.

** Lawrence J. White is an Assistant Professor of Economics at Princeton University.

By "concentration of economic power," or concentration in the large, I mean some measure of the total assets or economic activity in the entire industrial sector which are owned or controlled by a number of identifiable groups or organizations. High concentration, then, would mean a relatively few individuals or organizations owning or controlling a large percentage of the assets or sales of the industrial sector.

Monopoly-oligopoly and overall industrial economic power concentration frequently go hand-in-hand in LDC's. Their industrial sectors are comparatively small and do not show the full diversification of a Western industrial country. A few monopolies or oligopolies in large industries may well account for a large share of the assets of the entire industrial sector. But the two problems are not necessarily linked, and they need to be analyzed separately. That overall ownership concentration need not be associated with monopoly-oligopoly can be shown by the following example: Suppose only 100 families owned or controlled all of the industrial assets of a country. Overall concentration of industrial economic power would be high. Yet, if each family owned a company producing and selling in each industrial market and the 100 companies were of roughly equal size, this market structure might well yield results that were close to those of a perfect competition model.

Monopoly and Barriers to Entry

The static allocative effects of a monopoly are as relevant to LDC's as to developed countries: a monopoly tends to charge a higher price and produce a lower output than would a group of perfect competitors facing the same circumstances. The welfare implications of this monopoly outcome have become somewhat ambiguous since the development of the "general theory of second best" (Lipsey and Lancaster, 1956 57). The best that can be said is that a monopoly decreases social welfare if the resources that are released by the reduced output are absorbed by sectors that have a smaller percentage spread between price and social marginal cost.[1]

---

[1] Social welfare is measured here by the familiar consumers' surplus triangle. In some writings the spread between price and social marginal cost is the "degree of monopoly power," but it could also be caused by externalities or "quiet life" X inefficiencies (Leibenstein, 1966).

A second allocative effect is the "X-inefficiency" created by the lack of competitive pressure on the monopolist to minimize his costs. If one of the pleasures of monopoly is "the quiet life," the monopolist might not adopt the technologically feasible minimum costs that competition might otherwise force on him (Leibenstein, 1966). By using inefficiently too many resources (for his too small output), he may be sharing his monopoly profits but he is depriving the economy of additional goods and services.

Further, there is some evidence that a firm with a monopoly or market power position may choose capital-intensive technologies which are inappropriate for LDC's (Wells, 1972). Freed from the cost-minimizing pressures of competition, a monopolist may choose the "easy" technology of high capital intensity, thereby freeing himself from the difficulties of managing a large number of workers and also earning for himself the prestige of ownership of a bright, shiny, "modern" automated factory. If he were pressed by competition, he might well make a different choice.

An oligopoly market structure may not change the above conclusions very much. As mentioned above, the greater the ease with which rivals can come together to agree on common price and product strategies, the closer they will come to the monopoly outcome. Most countries, LDC's included, do not have the political and legal tradition of anti-trust that is found in the United States. The legal barriers to oligopolistic coordination are much weaker or non-existent. For industries with more than a few members, trade associations may serve as the vehicle for collusive agreements.

For a monopolist to continue enjoying the economic fruits of his position, there must be some barriers to entry into the industry at the production stage and at the marketing stage. Otherwise new firms would enter the industry at the production stage or at the marketing stage (via imports) and compete away the high profits. The LDC landscapes are usually covered with such barriers, both natural and artificial.

Bain (1956) has identified three types of barriers at the production stage: (1) economies of scale ; (2) control of scarce factors ; and (3) absolute capital requirements. The first of Bain's production barriers means that a new entrant must gain a significant share of the market to produce efficiently. A new entrant cannot slip "unnoticed" into an industry and thus faces the unpleasant choice of "overcrowding" the industry and inviting retaliation by the existing members of the industry or of entering at a smaller, less obtrusive scale but with higher production costs. The second barrier means that existing firms may have special access to scarce factors of production. New entrants can obtain these scarce factors only at increasing costs and hence are at a disadvantage compared to existing firms. The third means that the amount of capital required for entry, compared to the amounts that are normally lent in the capital markets and in the light of the perceived risks, may make financing and hence entry difficult and costly for potential entrants.

To this list, I would add a fourth barrier, at the marketing stage: (4) tariffs and licenses on competing imports. Barriers at both the production and marketing stage are necessary for monopoly profits to persist. If there were only production barriers, imports would enter the country from efficient producers abroad; only the "natural" tariff of transport costs would provide any monopoly profits. If there were only marketing barriers—import tariffs and licenses creating high domestic prices and potentially high profits—domestic firms would enter the industry and continue to do so until the supernormal profits disappeared.

All four categories of barriers are relevant for LDC's. Many of the barriers have been created by LDC government policies. In their efforts to industrialize, many LDC governments have maintained over-valued exchange rates, with consequent foreign exchange licensing and rationing. Imported capital goods, spare parts, and raw materials are available at favourable exchange rates and low tariffs, but only to holders of import licenses. Simultaneously, consumption goods are imported at unfavourable exchange rates and high tariffs or often are subject to outright bans. Consequently, those who have access to the capital goods and raw materials licenses have highly profitable markets for which they can produce.

The tariffs and quotas on the finished goods provide a marketing barrier. Simultaneously, the licenses on the capital goods and raw materials create a scarce resource barrier. These licenses are indeed a scarce resource, as is indicated by the black market prices for foreign exchange which exceed the official rate and by the high mark-ups that holders of these licenses receive when they sell their goods.

Import licensing as a means of rationing foreign exchange (as opposed to tariffs on a devaluation) usually has three justifications related to production decisions:[2] (1) government bureaucrats genuinely feel that they can allocate resources "better" than can existing markets; (2) licensing allows the "little man" a break, gives him access to licenses, and prevents him from being swept aside in the market by the more powerful "big men"; in theory, then, it is an encouragement to entry rather than a barrier; and (3) licensing provides an extra economic incentive—a favourable exchange rate for imported inputs—to spur investment and entrepreneurial activity.

Many bureaucrats think of unregulated competitive markets as destructive and wasteful of economic resources. They are no doubt encouraged in this view by those who would otherwise be subjected to the rigors of competition. On the other hand, bureaucrats recognize that unregulated monopolies will also lead to undesirable results, and many LDC bureaucrats see the markets of their countries as shot through with monopolistic imperfections. The "natural" way out is for the bureaucracy to influence the allocation of resources, so as to soften the apparent anti-social effects of competition and monopoly. That this course of action also heightens the power and importance of the bureaucracy is a non-trivial side effect. Whether the resulting allocation of resources is "better" depends on the goals that have been established. Little, *et al* (1970) have surveyed the growth and welfare effects of this method of allocation. The discussion of the other two justifications for licensing can shed some further light on this point.

---

[2] There are two other justifications frequently given for import licensing, especially for consumer goods : (1) Even very high tariffs will not choke off import demand ; this is based on a belief that demand curves are perfectly inelastic or nearly so. (2) Licensing, along with a low exchange rate, will keep the prices of imported goods low ; implicit here is the belief (or hope) that the recipients of these licenses will not take advantage of their scarcity value. The evidence accumulated by Alamgir (1968) indicates that this latter belief has not been justified, at least in Pakistan. Wholesale mark-ups have been considerably higher on licensed goods with low tariffs than on those goods with high tariffs or which were freely importable with more costly bonus vouchers.

The actual practice of import licensing is usually just the opposite of the "little man-equity" argument.[3] Licensing schemes usually have some explicit "historical shares" or "capability" basis. Even where these are not explicit, they are safe guidelines for a bureaucrat who is interested in minimizing the risk of something unexpected happening or in making sure that the licensed materials "are not wasted." And it is the "big men," the large, well-established firms, who usually have the largest historical shares and who seem the most competent and capable. The large firm is better known to the bureaucrats of the licensing agency. It "knows the ropes." Person-to-person relationships may be established. By contrast, a small firm or newcomer frequently appears risky and less competent. It is less well known to the bureaucrats. It may frequently be unfamiliar with the proper procedures it must follow. It may even be unaware of particular licensing opportunities.

As a consequence, the large, well established, monopolistic/oligopolistic companies frequently receive and continue to receive all or most of the licenses and continue to maintain their historical shares and their apparent competence. The process is self reinforcing. A scarce resource barrier is created. The same description and result would apply to the distribution of subsidized investment loans by LDC governments.

The last part of the import licensing rationale, the creation of incentives for investment, also leads to barriers to entry. The misallocation effects of these incentives have generally been recognized (Little, *et al.*, 1970). In addition, when favourable exchange rates (and rapid depreciation tax policies and low interest loans) encourage capital-intensive rather than labour-intensive production processes, the apparent economies of scale of the processes may be higher. There are higher levels of fixed costs which require larger volumes of output for amor-

---

[3] There is a mounting stock of evidence on this point. The Pakistani evidence will be provided in my forthcoming monograph. For India, see Fulda and Till (1968). For Colombia, see Diaz-Alejandro (1972, pp. 28-32). Ranis (1972) has noted that East Pakistan tended to receive a larger fraction of the total imports into Pakistan when the import regime was "liberalized" than when imports were more tightly licensed. Along similar lines, Killick (1972) has noted that direct price controls on commodities in Ghana, though nominally intended to help the poor and the lower classes, were only effectively enforced in those areas where the urban upper middle class shopped and on those items which they primarily bought.

tization. My argument here is that production functions may be non-homogeneous and that the labour-intensive methods of production may not exhibit significant economies of scale while the capital-intensive methods do, because of the lumpiness of the capital equipment. Faced by some factor prices, entrepreneurs will choose labour-intensive methods and many producers can be in the market. Faced by different factor prices, entrepreneurs will choose capital-intensive methods, economies of scale will be important, and only a few producers can be in the market. One frequently observes both phenomena side-by-side in LDC's. Many industries are composed of hundreds or thousands of small labour-intensive cottage or workshop operations, the owners of which face expensive capital and cheap (family) labour, and a small handful of large capital-intensive factories, the owners of which face much cheaper capital and comparatively expensive labour.

The high apparent economies of scale act as a barrier to entry in two ways. First, a government may be reluctant to grant licenses for the creation of new capacity in an industry if it appears that current production is not fully exhausting apparent economies of scale. The government may be sympathetic to please by the industry's current occupants that "there clearly is not any room for any new entrants." Second, potential entrants (beyond the cottage industry state) may feel the same way. Even if there are no licenses hindering a potential entrant but there are cheap capital goods (created, say, by low tariffs), he really will find the large-volume, capital-intensive method to be the cheapest, lowest-cost method. And under those circumstances, there indeed will be no room for him to enter as a large-scale producer.

The general imperfection of capital markets in LDC's adds the absolute capital barrier to the picture. Potential entrants into an industry may not be able to obtain adequate financing for their venture and consequently cease to be an active threat to the industry's occupants. The ownership of banks and insurance companies by groups already involved in industry may well raise this barrier even higher.

Finally, the supply of entrepreneurial talent in LDC's may be a scarce factor and operate as a barrier to entry. Nepotistic practices by firms or family groupings will continue to keep these barriers high. Entrepreneurship may be a learning-by-doing process, in which a great deal of trial and error is necessary to develop the necessary skills and sort out the more skilled practitioners from the less skilled. To the extent that licenses and other barriers impede free entry, potential entrepreneurs may never get the opportunity. Papanek (1962), though, has argued that all a government need do is provide the right incentives and the supply of entrepreneurs will come forth. The right incentives are the promise of high profits. If this is true, LDC governments may face a difficult dilemma: To break the initial barrier of entrepreneurship, LDC's may have to create other(e.g., licensing) barriers. But if the newly developed entrepreneurial class uses its economic power to achieve significant political power, the artificially created barriers may never come down, and entrepreneurship may spread only slowly beyond the initial fortunate group.

Monopoly, Profits and Growth

A country's real income is decreased by the static allocative effects of a monopoly. Since saving is usually a function of real income, and saving, investment, and income growth are usually linked, growth may be reduced by the existence of monopoly. These effects may be swamped, however, by the direct income distribution effects on saving. By reducing his output and raising his price, the monopolist effects an income transfer away from consumers and to himself. If he has a different marginal propensity to save then do his consumers, overall saving will be affected. In the extreme, if the entire industrial sector were composed of monopolies in each market, there would be an overall redistribution of income away from purchasers of industrial products (the services and agriculture sectors) to the industrial sector. The extent to which this income transfer would be shared between industrial wage earners and industrial capitalists in a LDC would be determined by the balance between the pressures of unemployment and pressures by trade unions, government social welfare, and industrial paternalism. To the extent that a LDC government has both growth and a particular income distribution as its goals, the income distribution effect of a monopoly will be important for its own sake.

The issues of growth, monopoly profits, and income distribution warrant further treatment. Much of the discussion concerning LDC's has been concerned with "growth" and actions that will "speed growth" or "hinder growth". Until recently, few discussants have stopped to ask "growth for whom?" Yet one can use a simple Lewis (1954) surplus labour model to determine that the major income beneficiaries of growth—until the surplus labour in the economy is exhausted—will be the group that currently receives the major share of manufacturing value-added. In many LDC's, this group is the industrialists.

This can be demonstrated fairly simply. The Lewis model assumes that marginal productivity is very low or zero in agriculture and that workers in agriculture receive income equal to their average product, which is close to subsistence. Wages in the industrial sector need only be higher than this by the margin necessary to attract workers from the countryside, though labour union and/or government social welfare efforts may keep industrial wages above this minimum. In any event, there is a large actual and potential supply of labour from the labour-surplus countryside which is willing to work in the industrial sector at the going wages. This press of surplus labour will keep industrial wages low (except for union or government efforts) until the surplus labour has been exhausted through the expansion of the industrial sector, this in turn being due to the reinvestment of the profits of the industrial sector.[4]

Until the surplus labour is exhausted, each additional unit of capital in the industrial sector will be able to be combined with labour being paid the same subsistence (or union) wage. We are thus in a world of fixed proportions, in which the marginal unit of capital will earn what the previous units of capital have earned, just as the marginal unit of labour will earn what the previous units have earned.[5] Typically, labour's share in manufacturing value added is only 25—40% in LDC's.[6]

---

[4] Also, the rising average productivity in agriculture as workers leave will also tend to push wages up. But population growth in the countryside will dampen this tendency.

[5] Only if industrial prices fall will this pattern change. But if some of the minimum consumption of the workers is also industrial goods, wages will fall too, though not by as much.

[6] By contrast, payroll costs are 50% of manufacturing value added in the United States (U. S. Department of Commerce 1970). Further, the non-labour share in both LDC's and the U. S. covers purchased business services, depreciation, interest, taxes and profits. Since the first four of these components are likely to absorb smaller percentages in LDC's, the true profit component is likely to be yet larger in LDC's, compared to the U. S., than is just indicated by the figures for the non-labour share of value added.

Growth along this pattern would mean an expansion in manufacturing employment—and a large rise in gross profits. If one measured income distribution according to capital and labour shares of the industrial product, the distribution would remain the same. But if one measured income distribution among individuals, and the number of porfit receivers remained relatively constant, this pattern of growth would generate a sharp worsening of the income distribution. Further, this would continue to get worse until the manufacturing sector became large enough to absorb all surplus labour and the industrialists had to start bidding up the price of labour. How soon this would occur would clearly depend on the size of the initial labour surplus, the rate and bias of technological change in agriculture and manufacturing, the rate of saving and investment by the industrial sector, and the labour-intensiveness of the technology in the manufacturing sector. It could take a long time, particularly if the rate of population growth is rapid and if the incentives in the system are encouraging the use of capital-intensive technology.

This growth-profits-income-distribution nexus poses a severe dilemma for LDC governments. High private profits will mean either high consumption by the rich or reinvestment, but yet more high profits and a substantial and growing wealth position for the rich. Raising workers' wages through minimum wage legislation, social welfare, and trade unions may siphon off some of the profits, but it will make labour more expensive, discourage the use of labour-intensive techniques, and thus reduce industrial employment. Further, in the absence of effective taxing or saving of workers' incomes, the reduced profits may slow down future capital accumulation and delay the eventual exhaustion of the labour surplus. Only if governments could efficiently tax and reinvest the profits would growth and equitable income distribution goals be simultaneously reached.

Concentration of Economic Power

The problems associated with the concentration of industrial economic power tends to focus on multi-company ownership. In a number of ways, these problems mirror the problems that have been discussed in connection with the recent conglomerate merger boom in the United States.

The possible advantages of multi-company ownership are its superior income-savings-investment capabilities in the face of imperfect capital markets, its risk-pooling advantages, and its ability to take advantage of economies of scale of management. All three arguments would seem to be especially relevant to LDC's, where capital markets are more imperfect, investment risks greater, and managerial talent in shorter relative supply than in developed countries.

The economic problems associated with multi-company ownership centre on the possible stifling of existing or potential competition. In principle a multi-company owner has a "deep pocket;" he can use the income flows from other areas to subsidize the temporary losses of one part of his operation. This may allow him to drive out or discourage the entry of competitors who are less well financed, and thus may allow him to develop or further his monopoly power in particular markets. This will be profitable, of course, only if the barriers to new entry are high. Reciprocal dealing arrangements, whereby a multi-company organization arranges favourable selling terms for one of its companies' products with an outside firm because other of its companies are important buyers of that outside firm's products, may restrict competition and raise the barriers to entry. Again, to the extent that entrepreneurial talent is scarce and capital markets imperfect, this discouragement to actual or potential competitors should be particularly relevant to LDC's.

Nepotistic practices by family-owned multi-company organizations may limit the growth and development of managerial talent in the LDC's. By favouring family members over outsiders, these organizations may effectively limit the potential new competition that they would have to face if the outsiders, after gaining experience, left the organization to start their own companies. This kind of favouritism could continue only if the individual companies had monopoly oligopoly power or had deep pockets. Otherwise, the pressures of competition would force companies to hire the most talented personnel, regardless of family origin.

Also, multi-company organizations may be able to perpetuate themselves and shut out new competitors by appearing to be the most capable organizations to receive government contracts or import licenses or investment licenses. Frequently, multi-company organizations in LDC's own or effectively control banks and insurance companies. As a consequence these banks and insurance companies may no longer be neutral financiers, looking only for the highest rate of return.

In summary, multi-company organizations pose a dilemma for LDC's and developed countries alike. Their strengths may allow them to surmount various barriers to entry and thus initially make markets perform better. But once established, these same organizations may raise new barriers behind them, making it more difficult for new entrepreneurs to follow them.

Are Monopoly and Overall Concentration Inevitable in LDC's?

The preceding sections have tended to stress the ways in which LDC government policies tend to foster monopoly and overall concentration. But, given the small size of the markets in LDC's and the small size of their industrial sectors, might not monopoly-oligopoly and overall concentration be inevitable in LDC's and curable only by the gradual growth of markets in these countries?

First, even if technology dictated a monopoly-oligopoly structure for an LDC industry,[7] the exercise of market power could be prevented by an open import policy. There is nothing inevitable about the exercise of market power.[8]

Second, overall concentration would be inversely related to the size of the industrial sector in a country and hence "inevitable" for LDC's, only if all three of the following propositions were true: (1) Technology dictated one and only one size of efficient plant for a given industry, regardless of the country or its factor endowments; (2) the percentage distribution of industries was similar for all countries; (3) the merger and multi-company laws and capabilities were the same in all countries. Since none of these propositions are true, overall concentration need not inevitably be high in LDC's.

---

[7] Though, as we argued above, the use of labour-intensive technologies might well ease these dictates.

[8] The exception here would be non-traded goods and services.

REFERENCES

1. Alamgir, Mohiuddin, "The Domestic Prices of Imported Commodities in Pakistan: A Further Study," *The Pakistan Development Review*, Vol. VIII, No. 1. (Spring 1968).

2. Bain, Joe S., *Barriers to New Competition* (Cambridge: Harvard University Press, 1956).

3. ———————, *International Differences in Industrial Structure* (New Haven: Yale University Press, 1966).

4. Chamberlin, Edward H., *The Theory of Monopolistic Competition*, 8th ed. (Cambridge : Harvard University Press, 1962).

5. Diaz-Alejandro, Carlos F., "The Mechanisms for Containing Imports : The System During 1971 and a Retrospective Look at Its Evolution (Import Controls)," Center Discussion Paper No. 158, Yale University Economic Growth Center (September 1972).

6. Fellner, William, *Competition Among the Few* (New York: Knopf, 1949).

7. Fulda, Carl H. and Till, Irene, "Concentration and Competitive Potential in India," *The Antitrust Bulletin*, Vol. XIII (Fall 1968).

8. Killick, Anthony J., "Price Controls, Inflation, and Income Distribution: The Ghanaian Experience," mimeo,presented at the Torremolinos Conference of the Development Advisory Service of Harvard University, September 1972.

9. Leibenstein, Harvey, "Allocative Efficiency vs. X-Efficiency," *American Economic Review*, Vol. LVI, No. 3 (June 1966).

10. Lipsey, R. G. and Lancaster, K., "The General Theory of Second Best," *Review of Economic Studies*, Vol. XXIV (December 1956).

11. Little, Ian, Scitovsky, Tibor, and Scott, Maurice, *Industry and Trade in Some Developing Countries* (London: Oxford University Press, 1970).

12. Lewis, W. Arthur, "Economic Development with Unlimited Supplies of Labor," *The Manchester School*, Vol. XXII, No. 2 (May 1954).

13. Merhav, Meir, *Technological Dependence, Monopoly and Growth* (New York : Pergamon Press, 1969).

14. Papanek, Gustav F., "The Development of Entrepreneurship," *American Economic Review*, Vol. LII, No. 2 (May 1962).

15. Ranis, Gustav, "Review of Books by Lewis and MacEwan," *Journal of International Economics*, Vol. 2, No. 2 (May 1972).

16. U. S. Department of Commerce, Bureau of the Census, *1967 Census of Manufacturers*, General Summary (Washington, D.C.: Government Printing Office, 1970).

17. Wells, Louis T., Jr., "Economic Man and Engineering Man : Choice of Technology in a Low Wage Country," mimeo, Development Advisory Service of Harvard University, 1972.

INTERNATIONAL ECONOMIC REVIEW

Published jointly by the Wharton School of Finance and Commerce, University of Pennsylvania and the Osaka University Institute of Social and Economic Research Association

Editor : E. Burmeister (University of Pennsylvania)
Co-Editor : K. Kuga (Osaka University)

Volume 15 **February 1974** **Number 1**

CONTENTS

(Contd.)

……

The Review is published fully in English, three times a year. The subscription price for individuals (for the subscriber's personal use only and the copies should not be made available to institutions) is $15.00 per year outside Japan and Y4,600 per year in Japan. The institutional subscription price is $25.00 per year outside Japan and Y7,700 in Japan. The price of a single copy is $8.50 outside Japan, Y2,700 in Japan. Subscriptions outside Japan should be forwarded to The International Economic Review, Department of Economics, McNeil Building CR, University of Pennsylvania, Philadelphia, Pa. 19174, U. S. A. Subscriptions in Japan should be forwarded to The International Economic Review, Osaka University Institute of Social and Economic Research Association, 1-1 Machikaneyama-cho, Toyonaka, Osaka 560, Japan.

Manuscripts for publication and editorial communications should be sent in triplicate to the Editor or the Co-Editor of the Review.

SOCIAL AND ECONOMIC STUDIES

Published by

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF THE WEST INDIES
JAMAICA, WEST INDIES

A journal devoted to the publications of research and discussion on agricultural, anthropological, demographic, economic, educational, monetary, political and sociological questions, with emphasis on the problems of the developing territories, particularly those in the Caribbean.

Vol. 22 **December 1973** **No. 4**

SUBSCRIPTION RATES :

Per volume : J$6.00, W. I. & T. T. $14.40, £3.00, U. S. $7.50
Single number : J$2.00, W. I. & T. T. $4.80, £1.00, U. S. $2.50

Subscriptions and orders for back numbers should be addressed to :
The Publications Editor, *Social and Economic Studies*,
Institute of Social and Economic Research, University of West Indies,
Mona, Kingston 7, Jamaica W. I.

FORTHCOMING PUBLICATIONS OF THE BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

RESEARCH MONOGRAPH NO. 1

Bangladesh : National Income And Expenditure, **1949/50—1969/70**

by

Mohiuddin Alamgir And Lodewijk J. J. B. Berlage

Price : Tk. 30.00 or US $ 10.00 (Hard Cover)

Tk. 20.00 or US $ 7.50 (Soft Cover)

RESEARCH MONOGRAPH NO. 2

Saving In Bangladesh, **1959/60—1969/70**

by

Mohiuddin Alamgir And Atiqur Rahman

Price : Tk. 30.00 or US $ 10.00 (Hard Cover)

Tk. 20.00 or US $ 7.50 (Soft Cover)

You can get your copy from:

Publications Officer
Bangladesh Institute Of Development Studies
Adamjee Court, Motijheel, C/A., Dacca-2, Bangladesh.

SUBSCRIPTION RATES

for

THE BANGLADESH DEVELOPMENT STUDIES
up to December 1974

INLAND	FOREIGN
General	**Annual**
Taka 5.00 per issue	US $ 10.00 or UK £ 4.00 or
Taka 20.00 per year	equivalent thereof in other currencies
Students	**Single copy**
Taka 3.00 per issue	US $ 2.50 or UK £ 1.00 or
Taka 12.00 per year	equivalent thereof in other currencies

SUBSCRIPTION RATES

for

THE BANGLADESH DEVELOPMENT STUDIES
effective from January 1975

INLAND	FOREIGN
General	**Annual**
Taka 7.50 per issue	US $ 15.00 or UK £ 6.00 or
Taka 30.00 per year	equivalent thereof in other currencies
Students	**Single copy**
Taka 18.00 per year	US $ 3.75 or UK £ 1.50 or
	equivalent thereof in other currencies

Air postage extra. Payments to be made through bank drafts/postal orders.

Printed at ABCO PRESS, 6-7 **Aulad Hossain Lane,** Dacca-1 and published
by the Bangladesh Institute of Development Studies, Dacca.

THE
BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

Adamjee Court, Motijheel Commercial Area, Dacca-2, Bangladesh

The Institute carries out basic research studies on the problems of development in Bangladesh. It also provides training in socioeconomic analysis and research methodology for the professional members of its staff and for members of other organisations concerned with development problems.

THE BANGLADESH DEVELOPMENT STUDIES

(Formerly The Bangladesh Economic Review)

Volume II July 1974 Number 3

Articles

The Economic Development of Malthusia

Austin Robinson

Controlling Money Supply in Less Developed Countries : The Case of Nigeria

T. Ademola Oyejide

Aspects of the Management of Nationalised Industries in Bangladesh

Qazi Kholiquzzaman Ahmad

Nationalised Industries of Bangladesh : Problems and Prospects

Mohiuddin Alamgir

Notes and Comments

Tariff Protection and Industrialization in Nigeria : A Comment

Jagdish N. Bhagwati

Adjustment Dynamics and the Elasticity of Substitution : The Case of Manufacturing Activity in Bangladesh

L. Demery and H. Jahangir

The Quarterly Journal of
THE BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

THE
BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

ADAMJEE COURT, MOTIJHEEL COMMERCIAL AREA, DACCA-2, BANGLADESH

The Institute carries out basic research studies on the problems of development in Bangladesh. It also provides training in socio-economic analysis and research methodology for the professional members of its staff and for members of other organisations concerned with development problems.

Manuscript and editorial correspondence should be addressed to the Board of Editors, *The Bangladesh Development Studies*, Adamjee Court, Motijheel Commercial Area, Dacca-2, Bangladesh. Style instructions for guidance in preparing manuscript in acceptable form will be provided upon request.

The Bangladesh Development Studies

Volume II July 1974 Number 3

Articles

Notes and Comments

Book Review

Book Reviewed

733 *Pakistan : Failure in National Integration* by Rounaq Jahan, Oxford University Press, Dacca, 1973.

Reviewed by : *Abu Ahmed Abdullah*

The Economic Development of Malthusia[1]

by

AUSTIN ROBINSON*

I

One hundred and seventy five years ago a shy young Fellow of Jesus College in this university asked a question which still remains just as relevant and just as urgent today. He asked, if I may paraphrase him in the language of today, whether economic development was possible, or whether it would be frustrated by the growth of population.

It is fashionable to say that Malthus has been discredited by subsequent history. But that is a very dangerous half truth. Malthus argued that any country was faced by two alternatives : it must either have a set of institutions, customs and practices which would limit population growth, or population would grow faster than production, income per head would remain at subsistence level, and equilibrium would be achieved by sickness, a rise of death rates and other factors that he subsumed under the name of "misery".

If we look at the world today it divides into two halves—the world that we think of as the advanced countries and the world of underdevelopment, of backwardness, of acute poverty. It is no over simplification to divide those two worlds into the world that has broken through the Malthusian barrier into cumulative growth and the world that has failed hitherto to break through the Malthusian barrier and which continues to live under conditions of near stagnation, little above the subsistence level, in very much the conditions that Malthus envisaged.

---

[1] In memory of Kingsley Martin, for many years editor of the *New Statesman*, an annual memorial lectureship is given in Cambridge University, England, on some topic relating to South Asia—an area in whose welfare he was throughout his life deeply interested. This represents the lecture that I was invited to give in March 1974. The lecture is given to a non-specialist audience, mostly of senior members of the university, and it is written for such an audience. In introducing it I emphasised that I was taking Bangladesh as my example of the problems of developing a very poor country with a rapidly growing population only because I was at the moment steeped in the background of Bangladesh. The problems are common to India, Sri Lanka, Indonesia, Pakistan and other countries of South Asia. Bangladesh is in no sense unique or outstanding. In presenting it to Bangladesh readers, I do so with diffidence and in hope that they will not feel it an impertinence that I, a foreigner, have discussed a problem which inevitably touches on matters of deep personal and national convictions. I have done so only because I believe that these issues are of immense importance to the development of a vigorous, healthy and prosperous Bangladesh.

*The author is an Emeritus Professor of Economics, Cambridge University, Honorary Vice-President, International Economic Association.

It is, moreover, a paradox that it is in the fifty years since I first became an economist and first read Malthus that the problems of the Malthusian barrier have become most acute. It is a paradox that in my lifetime no group of men have probably done so much to add to the human misery of Asia as that devoted and self-abnegating body of men—the medical profession—when they substituted throughout the world of Asia the death rates of the twentieth century for those of the eighteenth century while leaving almost untouched the birth rates of the eighteenth century.

Let me illustrate, as I shall do throughout, from Bangladesh. In 1901 the population of that country was 29 millions. With a birth rate of about 54 per thousand and a death rate of 46 per thousand, the population was growing in 1921 about 8% per decade. If it had continued to grow at that rate, it would have reached 43 millions by 1971. In fact the 1971 population was about 77 millions (before the casualties of the recent war)—34 millions more than it would have been on the basis of 1921 birth and death rates. Thus the annual rate of growth of the Bangladesh population is roughly four times what it was when I was an undergraduate. When I was an undergraduate the population of Bangladesh was doubling every 90 years; today it is doubling every 24 years. If for the moment I widen the horizon, there are today some 370 millions more in India, Pakistan and Bangladesh together than there were when I first became an economist in 1921, as many as the total population of the United States, France, Western Germany and the United Kingdom. There are some 250 millions more than there would have been on the basis of 1921 birth and death rates—about as many as the whole population of the European common market. It is for these that we have been struggling to make adequate provision.

At the moment we do not really know whether the rates of natural increase of these Asian populations are growing or declining. While birth rates have begun to decline, the death rates have been continuing to fall and the gap between the two has been sometimes widening, sometimes narrowing. A further fall of the crude death rate of Bangladesh to the 14.5 per thousand of Turkey and a slight failure of the crude birth rate to fall would lead to an increase rather than a decrease in the rate of natural increase.

II

I have started from this background because I want to look today afresh at some of the consequences and implications of this population explosion of my lifetime. We are all of us greatly concerned with the differences between the rich and the poor nations. We are faced by the political implications of the rising expectations of the poorer nations of the world and the growing problem as to whether these expectations can be matched by corresponding growth of production and resources. We are all worried about the income gap between the rich nations and the poor nations and whether the gap can be narrowed. All these are among the many issues raised in the past two or three months by the struggles between the old producing and other primary product countries on the one hand and the advanced countries on the other hand.

It is cold comfort to remember that the national incomes of the backward countries, if regarded as countries, have been growing faster—slightly faster, by about 4.7% a year on average as against 4.3% a year. For what is much more significant is that, since their populations have been growing much faster—on average by about 2.4 % a year as against 1.3% a year—income per head has been growing more slowly—on average by about 2.7 % a year as against the 3.0% of the advanced countries.[1] Thus it is primarily as a result of population growth that the gap is opening rather than closing.

What I propose to do is to try to look twenty years ahead : firstly on the basis of a rate of growth of population which, without claiming to be exact (until the current census has been held one cannot hope to be exact), reflects the approximate present rate of a country like Bangladesh—3% a year, about 34% a decade; secondly on the basis of the rate of natural increase that is current in Western Europe today, which I shall take to be an average of about 0.45% a year —a little under 4.6% a decade. If one starts from a 1973 population of 76 millions for Bangladesh that would imply in the one case a population twenty years hence of about 83 millions; in the other case of 137 millions and the need to make provision for it.

---

[1] See S. Kuznets, "The Gap : Concept, Measurement, Trends", in G. Ranis (ed.) *The Gap between Rich and Poor Nations*, pp. 40—41, London Macmillan, 1972.

I want to look at the implications of these two alternative populations from two aspects :

(i) briefly, as Malthus did, in terms of the problems of food supply;

(ii) at greater length, in terms of what Professor Sauvy has called the problems of demographic investment.

III

Let me look first, then, at the problems of food supply and in particular at the critical problem of food grains. If one takes the daily consumption of 15 oz. which the United Nations Relief Organisation in Dacca took as its minimum objective, the requirement for this year's 76 millions of Bangladesh population is 11.5 million tons a year. For 83 millions on the same it would be about 12.6 million tons. For 137 millions it would be about 21 million tons.

If one makes allowance for the increase of consumption likely with the increases of incomes to be expected, the foodgrain requirements become about 14.5 million tons for the slowly rising population, about 25 million tons with a population rising at the present rate. The latter represents, you will realise, more than a doubling of the foodgrain requirements.

Escape from this by import is not really practicable. Bangladesh is a country with very limited mineral resources. It must import not only the capital goods but also most of the materials and many of the consumer goods that it needs. A balance of payments requires that the country must be self-sufficient in foodgrains and find space to cultivate also the jute, the tea and other agricultural exports it needs.

Almost all available land is under rice during the monsoon season. It is possible to extend the area under rice only by growing it at other seasons of the year also on land that needs to be irrigated for the purpose. This requires a heavy investment in tube-wells, irrigation channels and the like as well as in improved roads, credit facilities, transport and other facilities.

The total irrigated area is at present about 1 million acres. There are estimated to be about 7 million acres capable of irrigation. With irrigation, and with the improved varieties, the fertilizers and other things that represent the "green revolution", rice yields on irrigated land are about 1 ton per acre. An additional 6 million irrigated acres, some of it already cultivated in the *boro* season without irrigation, may provide perhaps 5 millions out of the necessary increase of 13.5 million tons.

The remaining 8.5 million tons of increase would need to come from increased yields per acre. This implies an increase of a little over 50% in the yield per acre, after allowing for the greater irrigated area. Spread over a period of twenty years this is just within the reach of possibility. It would leave the average yield per acre in Bangladesh still a little below the present average of Thailand and far below the average of Taiwan or Japan.

There are formidable administrative problems involved, formaidable problems of agricultural modernisation, formidable problems of investment in fertilizers, irrigation and the rest. But for another two decades Bangladesh, with the help of the "green revolution" seems likely to be able to survive the process that so frightened Malthus– the process that he so memorably but so inaccurately described as that "population, when unchecked, increases in a geometrical ratio; subsistence increases only in an arithmetical ratio". Memorable, because for a hundred and seventy five years this has represented the totality of what any undergraduate has known about Malthus. Inaccurate because one has to remember that "with every mouth, God sends a pair of hands" : the phrase has no meaning unless one can predicate the limits of land-use, the limits of land-saving innovation, the limits of the substitution of labour and capital for land, the limits of the adaptability of the human diet. There is no real meaning in the arithmetical ratio.

For the next twenty years there may be no insoluble problem. If one looks forward beyond that, with present rates of population growth the outlook is bleak. We can, that is to say, perhaps for a little longer hold the Malthusian devil at bay. But he is held at bay at very formidable cost in other possibilities foregone. Its this that I primarily want to discuss here.

IV

I want to turn, therefore, to the second question, the question of the extent of what has been called the demographic investment in a country like Bangladesh—the investment that is necessary in order to stand still in terms of capital equipment per head of population.

In the First Five Year Plan published a few weeks ago by the Bangladesh Planning Commission it is planned to devote to development during the plan period about 9.4% of the locally produced domestic product and to raise the total investment to an average of 15.3% of gross domestic product with the help of the hoped for inflow of foreign capital—which will cover 40% of the whole investment. It is, however intended that the capital inflow shall gradually decline from over 60% of all investment this year to 27% in the final year.

What is more important from my immediate point of view is that over this period it is intended that 24% of the whole investment shall be devoted to increasing agricultural output sufficiently to cover the needs of a population that was expected to grow by an average of 3.0% without the family planning programme they are introducing and by 2.9% a year despite it. Of this agricultural development expenditure about 85% would not be required if population were growing at the rate of that of Europe, and would liberate for other things a little over 20% of the whole investment in development.

Of the planned investment in trade, amounting in all to about 5.4% of the total, a large part, which I shall assume to be 80% of the whole is demographic investment in Professor Sauvy's sense—in that it is a consequence of handling the increased agricultural and other output consequent on population growth. Here again a saving of about 4.3% of all investment expenditure would result from a European rate of population growth. Let me hasten to say that a different pattern of growth would require its corresponding investment in trade. I shall return to this later.

The third great area of demographic investment is that represented by housing. Of all Bangladesh planned investment, over the next five years housing and physical development represents about 14%. The desperate need to make improvement in this field is beyond question. But again almost 90% of the need represents the demographic investment needed to keep up with population. If the population growth were that of Europe, the investment needed to achieve the standard of the end of the present five year plan might save about 12.5% of total investment and free it for other use.

It is very much more difficult to calculate how much of the planned investment for education and health services is really demographic investment. Part of the investment is designed to extend the present standards to a larger population. Much of it is intended to raise the general standards that now exist and to attack the long-standing problems of illiteracy and neglect of the sick. The best estimates that I can make—sufficiently accurate for our present purposes—is that 30% of the planned expenditure on education and 20% of the planned expenditure on medical services is demographic. Together these demographic investments represent about 3.1% of all investment. The demographic investments in energy and in communications add another 8% of the whole of investment.

Thus in the sectors that I have thus far considered—agriculture, and the associated trade, housing and social services, energy and communications—the present rate of growth of population requires, in order to stand still in terms of capital equipment per head of population, a little over 48% more of the planned capital investment than a European growth rate would require.

The sectors that I have not yet touched are the important ones of industry and natural resources. I want to approach these in a rather different way. I shall content myself for the moment by making a rough and ready summing up for the whole economy. In the present conditions of Bangladesh the capital/output ratio in terms of new, undepreciated capital is just about 3. That is to say, if population is growing by 3% a year and you need to increase the national product to match by 3%, you must invest 9% of the national product. Replacement of worn-out equipment acquires about 2.5% of gross national product in present conditions. Thus total investment to stand still represents just about 11.5% of gross product. The total planned development investment represents 15.3% of gross product. That is to say, the cost of standing still with present population growth represents just about 75% of all the investment. If you give £10.00 to raise the standards of life in Bangladesh, £7.50 goes to deal with the consequences of population growth, £2.50 goes to raise standards. The rate of internal domestic saving in Bangladesh—apart that is to say from the inflow of foreign capital—is not sufficient over the average of the plan period to cover the investment required to stand still. By the end of the period it is planned to raise domestic saving by great effort to a level at which the demographic investment will absorb 81% of it.

V

I have elaborated this because it represents, as I would see it today, the mechanism of Malthus's "misery". If a country fails to solve by forethought and institutions the problems of a population explosion, income per head falls to a level at which domestic saving fails to cover the necessary replacements plus the demographic investment. Capital per head and productivity fall. A larger proportion of the population fall below the minimum adequate standard of life; disease, sickness, mortality and particularly infant mortality tend to rise.

There is a second mechanism which I shall not attempt to elaborate. In any country with a given industrial structure the level of imports tends to grow with the country's own population and growth. The level of exports tends to grow with the growth of the countries that consume the exports. If your population is growing faster than that of your customers you tend to run into balance of payments difficulties which lead to raised interest rates, restrictions and other obstacles to growth. It is no accident that almost without exception the advanced countries "took off" in periods when they had very favourable balances of payments.

In the particular case of Bangladesh less pressure to grow food grains for internal consumption would mean greater resources to produce crops for export: jute, which is being crowded out by rice ; rice itself for export ; other potential export crops. It would mean a very much easier problem of the balance of payments.

VI

I want to turn now to look at the problems of industrial investment. But I want to look at them against the backcloth of what I myself would regard as the most formidable and potentially the most dangerous of all the political and economic problems of Asia—for this is a problem that is common to India, Indonesia and all the great overpopulated and backward countries of Asia.

One of the great problems of these backward countries is that of creating new jobs at a rate that will balance the growth of the active population. If that process fails, there gradually builds up an accumulation of unemployed and underemployed, very largely in the rural areas, where 95% of the population have their homes. And, more serious, the process of redeployment from agriculture into other activities, which is the whole basis of the early stages of all economic advance, comes to a standstill.

The Bangladesh planners have very bravely attempted to measure the present extent of this underemployment. They have calculated the number of man-days per acre per year required for each of the main crops on the basis of farm studies. They have assumed that 240 days a year is the amount that those engaged in agriculture would wish to work. On this basis the required agricultural employment is only 63% of the man-years available. There is unemployment and underemployment equivalent to 37% of the active population in agriculture, to about 7.4 million workers in agriculture alone. Outside of agriculture there are, at a conservative guess, about another 1.6 million, making a total of present unemployed and seriously underemployed amounting to 9 million—about 30% of the active population.

The active population on the conservative basis that it is calculated in the plan, is rising by about 800,000 a year. If one takes, as I would myself do, a slightly higher normal participation rate, the additional population seeking work is about 1 million a year, in a world in which female participation is abnormally low, and no provision is made to increase it.

This huge arrear of unemployment is not, of course, the result of anything that has been done, or not done, by the present government of Bangladesh. It is the accumulation over decades of the effects of population growth combined with failure to deal with its consequences.

How does the present plan propose to handle it ? The Plan sets the objective of creating the equivalent of 5.4 million additional full-time jobs over the period of 5 years, during which it expects that the active population will increase by 3.9 millions. At the end of the period, if all does well, underemployment will have been reduced by 1.5 millions, to about 7.5 millions, or about 25% of the active population.

Of the 5.4 million jobs, 3.1 millions represent the additional man-years required in agriculture and in the rural works programmes. A little over 1 million represent new jobs in construction and services. Only 650,000—130,000 a year, are expected to be absorbed in industry; a final 600,000 in social services.

This represents, let me emphasise, as good a solution as can be achieved within the terms and constraints facing the planners. But it makes a very slow attack on the problems of unemployment. It would take some 25 years on this basis to come near to eliminating it and 20 years to bring it down to tolerable dimensions.

Can one, within the present assumptions, do better than this ? To answer that question one must ask, since there is little unemployed capital, how much it costs in investment to create a job. The answer is : in agriculture and rural works about U. S. $600 ; outside of these about $2,400 a job : in industry and energy alone about U.S. $3,000. But in small scale industry the figure is nearer to the U. S. $600 of the agricultural sector. The urgency of developing "appropriate technologies" is obvious. But that task is very much more difficult and more complicated than most economists have realised.

VII

I want to come back now to construct my alternative world—the Bangladesh with a European rate of population growth. What I want to emphasise first is that in the short period the gross domestic product, the rate of saving and investment, would be virtually unchanged. The added potentially active population serves only to maintain the level of underemployment and to diminish the level of consumption per head.

Assume then, as before, that gross national product is growing by the 5.5% a year of the present plan : income per head at the end of the first plan period would be 29% higher as against the present rather optimistic 13% increase of the plan.

But the main effect is to make unnecessary the additional purely demographic investment in excess of the European rate. This amounted, let me recall, to 48% of all investment outside of industry. If with fewer mouths to feed, one could redirect that investment into the sectors other than agriculture and rural works one could do a little more than double investment in industry and the related trade and create in these sectors, I calculate, about another 2 million jobs. With the remaining necessary increases in the other sectors there would be a creation of about 3.1 million jobs, to set against an increase during the five years of only

400,000, in the active population. One would be reducing the unemployment by nearly 2.7 millions in contrast to the 1.5 millions that the present plan sets out to achieve.

If one looks further ahead, by the end of the second plan one would, on this basis, with a progressively rising level of savings and investment, be getting within sight of the elimination of severe underemployment. In the third five years one would begin to be drawing down the proportion of all active manpower in agriculture and to be thinking not as now of reducing the size of holdings but, as we do in Europe, of increasing them. By the end of the twenty years that I have set as my horizon income per head, would be about 2½ times that of today—comparable to that of Brazil or Turkey.

VIII

Let me contrast the present realities of Bangladesh and its problems. For the past twenty years it has been one of the saddest cases of Malthusian poverty and near stagnation. Of its 76 millions, over 50% of live below any acceptable poverty line. It has one of the lowest expectations of life of any country in the world. At present only about a quarter of all population, about a half of the adults, a tiny proportion of all women are literate. They live imprisonned in their poverty with no hope of escape. What I regard as the best plan that could be made within the existing constraints sets a target to increase income per head at about 2.5% a year—about 25% a decade. But in the first plan period it is necessary to increase the rate of saving and of public expenditure and diminish the share going to consumption. When one allows for this the increase of consumption per head in the first plan period is very small—almost negligible. If in subsequent decades the savings ratio has again to be raised, the increase in consumption per head during the twenty years is unlikely to exceed about 40%.

But one needs to remember that these are targets. Any shortfall, any greater increase in population, is reflected wholly in income per head. If I write not the targets but what, in the light of past experience, I would expect, I would come out with a growth of consumption per head over 20 years, with 3.0% population growth, of the order of 30%.

30% to 40%—as against a possible 150%—an increase of one third as against multiplying income by 2½ times.

IX

This is, I know, a dream. But it is a dream with a purpose. I have wanted to bring to the surface what I believe to be the essential conditions of achieving the objectives we all have in our hearts—the objectives of narrowing the gap in income per head between the rich countries of the world and the poor countries and of reducing as rapidly as we can the poverty of the countries that are poorest.

Of all the countries that have broken through the Malthusian barrier and have "taken-off" into cumulative growth, only one so far as I discover, has done so with a rate of population growth of more than 2% a year, and the great majority of them at times when population growth was nearer to 1% a year. The United Kingdom did it with a population growth of about 1% a year—roughly 10% a decade—France with under 4% a decade—Germany with about 15%—Japan with 9%.

The one exception was the United States which, at the time of its industrialisation already had an income per head twice that of the average of all developing countries today—higher than that of Spain or Greece today.

The slow rate of population growth and the high rate of rise of income per head is important because it has been the power to raise the rates of saving and investment as income per head has risen which has played a central part in the dynamic of take-off.

All of us in Europe went through this process in our pre-medical-revolution stages. Even Japan achieved its take-off—its industrial revolution—before its medical revolution.

I do not myself believe that anything like an effective and permanent take-off is practicable with a 3% population growth in a large country of great initial poverty. It would require a net inflow of foreign capital not much less than the total of domestic savings, with the certainty that, if this took the form of borrowing, the rising level of repayments would very rapidly diminish the net inflow.

Thus I would myself regard the solution of the problems of population growth as a precondition of the sort of narrowing of the income gap that we are all so anxious to see.

X

It is, of course, idle to suppose that a country can move from a state of 3% population growth a year to one of 0.5% overnight. But it is legitimate to ask over what sort of period this can be done. The present Bangladesh plan—very rightly cautious—assumes that over five years the birth rate and the death rate will decline at rates that would take 25 years or so to bring the rate of natural increase below 20% a decade.

Is this the most that one dare hope? What have other countries done? Poland, Bulgaria, Hungary, Roumania, Yugoslavia have all just about halved their crude birth rates between 1921 and 1971. In the cases of Japan and Taiwan the crude birth rate has been reduced over the half century by about 45%. In most of these cases there has been somewhere a twenty year period of very rapid reduction—in the case of Japan between 1941 and 1961, when the rate was reduced by almost the whole 45%; in the case of Singapore where it was halved between 1951 and 1971. These are now the countries which have broken through the Malthusian barrier and are on their way to take-off and cumulative development.

Is it too much to hope that over the next twenty years Bangladesh can bring the birth rate down from its 47 per thousand to 24 per thousand. With a crude death rate of about 14 per thousand and a 10 per thousand—1%—rate of natural increase? Ultimate take-off into cumulative growth might then be within sight. That is, if I may say so, the Bangladesh not perhaps of my dream but of my waking hopes—a Bangladesh with a population that will have grown during the transition to about 106 millions—by 30 millions instead of the 60 millions or so that we must now expect—but a Bangladesh which by 1995 will be well poised for take-off, with declining unemployment and more rapidly growing income and investment—a Bangladesh which is far stronger, more vigorous, a greater power in the world than the Bangladesh that I have likened to Malthusia.

XI

I have sought to show how formidable—how very nearly insoluble—are the problems of developing an Asian country with a population growth of 3% a year. When Malthus asked this question he earned for economics the title that so long clung to it: the title of "the dismal science." Not every story has a happy ending. This story in particular of the stagnation and the widening gap between the poor countries of Asia and the rich countries of Europe and America shows as yet no sign and indeed little hope of happy ending.

It is a problem that is singularly diffcult to solve. Some of the economic problems of the world are problems of policy making. They are soluble if a small number of responsible persons can understand the issues and act wisely. Other problems—and this is one of them—are soluble only if all the many individuals of a country can understand and act differently.

But our generation has opportunities that earlier generations have not possessed: the opportunities presented by the "green revolution" which serve to postpone and ease the most acute pressures of food supply; they have given us, perhaps, twenty years in which to achieve the necessary adjustments; the medical revolution which is at last beginning to show possibilities of affecting birth rates as well as death rates; the modern mass media and methods of communication which allow those who lead a nation to communicate far better with those who are led. The opportunities are beginning to emerge for our generation.

But it is not wholly a matter of communication. One has got to create a consciousness and awareness of the urgency and the formidable character of this problem. And one has got to understand far better than we do at present the problems created for the individual by a slower population growth: by less likelihood that parents will have children to provide for their old age; by less likelihood that the children will be in the rural area with their parents in their old age. All these social consequences need not only to be foreseen but also to be solved. Their solution is almost certainly a precondition of success.

One has got to create this awareness first in the minds of the politicians and leaders of these countries. For it is they alone who can in the end change the thinking of the millions. I would like to think that I am making my own very small contribution to their awareness that the next twenty years offer an opportunity which, if seized, may set Asia on the way to new things; which, if lost, will never recur.

Controlling Money Supply in Less Developed Countries : The Case of Nigeria

by

T. Ademola Oyejide*

I. INTRODUCTION

The current debate in the economic literature on the efficacy of monetary policy as a means of influencing economic activity has its implications for the less developed countries. These implications arise importantly because less developed economies are subject to chronic inflationary pressures which brought about by expansionary fiscal policy actions which are, in turn, "permitted" or fuelled by credit creation through increases in the supply of money.[1]

This paper addresses itself to the question of how to control the supply of money as well as the related problem of the choice of an appropriate and effective control mechanism. Research on money supply processes, especially in the United States has led to the development of the money multiplier approach to money supply determinations.[2] In the money multiplier framework, money stock is linked to high-powered money or monetary-base via a deceptively simple-looking multiplier. This approach suffers, in its simple form, from a number of problems—all related to its mechanistic and static nature as well as the alleged variability of the various ratios which constitute the component parts of the multiplier coefficient.[3]

---

*Dr. Oyejide is a Lecturer in Economics at the University of Ibadan, Ibadan, Nigeria. He gratefully acknowledges the financial support of a Senate Research Grant.

[1] This problem is analysed, for Nigeria, in [8].

[2] See, in particular [2, 5].

[3] These problems and similar criticisms are pointed out in [1, 6].

In Section II an attempt is made to tackle some of the problems of the money multiplier approach by examining the question of the non-constancy (or variability) and non-uniqueness of the multiplier (which constitute the major criticisms of the money multiplier model). Some dynamic reformulations of the basic model via the introduction of expectations and partial adjustment mechanism in the asset portfolio choice of commercial banks and the non-bank public are presented in section III.

Section IV presents some empirical evidence based on Nigeria on the predictive performance of various forms of the multiplier model. Section V contains the conclusions and policy implications.

II. THE VARIABILITY AND NON-UNIQUENESS OF THE MULTIPLIER IN MONETARY-BASE MODELS

In its simple form, the money multiplier model is easily stated. Let us begin with the 'narrow' definition of money, i. e., money (M_1) as made up of currency (C) and demand deposits (D). Then,

$$M_1=C+D \qquad (1)$$

and

$$B_1=C+R \qquad (2)$$

where B_1 represents the first definition of monetary-base, a variable which is measured as the sum of currency and bank reserves (R). Equations (1) and (2) yield the following relation:

$$\frac{M_1}{B_1}=\frac{C+D}{C+R}=\frac{1+D/C}{1+R/C}=\frac{(D/R)(1+D/C)}{D/R+D/C}\,. \qquad (3)$$

Now, if the demand deposit to currency ratio $D/C=c$, and the bank reserves to demand deposit ratio is $R/D=r$, then,

$$\frac{M_1}{B_1}=\frac{(1/r)(1+1/c)}{(1/r+1/c)}=\left[\frac{1+r}{r+c}\right] \qquad (4)$$

and therefore,

$$M_1=\left[\frac{1+r}{r+c}\right]B_1 \qquad (5)$$

or

$$M_1=m_1\ B_1 \qquad (5^1)$$

where m_1, which is made up of the ratios listed above, is the multiplier.

The impressions which this exact relationship between money stock and monetary-base gives is that once the policy-maker knows the value of the multiplier and the value of the monetary-base, he can exactly predict the value of the money stock. In other words, if the policy maker or monetary authority wishes to control the money supply, he must first forecast the value of the multiplier and once this is done, the amount of monetary base which is required to achieve the desired money stock is determined.

But the multiplier is, in fact, merely a summary of many endogenous factors which together influence the process of money supply determination and what the money multiplier model essentially does is to reflect the behaviour of three broad sectors of the economy; i. e., the behaviour of the monetary authorities as reflected by changes in the value of monetary-base, the behaviour of commercial banks as reflected by changes in the ratio of demand deposits to reserves, and the behaviour of the public as reflected by changes in the deposit to courrency ratio. The monetary authorities can of course, directly control their own behaviour by determining the monetary base and if the money multiplier was always the same, changes in the money stock would be determined entirely by changes in the quantity of monetary base which the Central Bank makes available. But the multiplier is clearly not constant since it reflects changes in the behaviour of the commercial banks as well as the public; hence money stock cannot be uniquely determined by changes in the monetary base alone.

In addition to its not being constant over time, the numerical value of the money multiplier is also not unique. One can easily prove this point by examining different formulations of the monetary base model and noting the implication of each formulation for the value of the multiplier. For example, if one uses a 'wider' definition of money stock (M_2) which adds savings deposits (S) to currency and demand deposits, a new model is derived. Thus,

$$M_2 = C+D+S \tag{6}$$

and

$$B_1 = C+R \tag{6^1}$$

where R is now defined as r (D+S) and $s=\frac{S}{C}$ is the savings deposit to currency ratio. Then we have

$$M_2=\left\{\frac{1+c+s}{r+rs+c}\right\}B_1 \tag{7}$$

$$M_2=m_2B_1 \tag{7^1}$$

where m_2 is the new money multiplier.

In a country like Nigeria where treasury bills (TB) held by commercial banks can be used as reserves against customers' deposits, the appropriate multiplier, using M_1, is derived as follows:

$$B_2 = R + C + TB \tag{8}$$

Let $t = \frac{TB}{D}$ is the ratio of treasury bills to deposits.

Then, by substitution,

$$B_2 = R + C + tD. \tag{8^1}$$

Combining equations (1) and (8^1) we have

$$M_1=\left\{\frac{1+c}{r+c+t}\right\}B_2 \tag{9}$$

or

$$M_1=m_3B_2. \tag{9^1}$$

Another formulation of the model is derived if monetary-base is defined as

$$B_3 = C + R + FR \tag{10}$$

where, FR represents foreign reserves. Now if $f = \frac{FR}{D}$ is the ratio of foreign reserves to deposits, the combination of equations (1) and (10) yields the expression:

$$M_1 = \left\{ \frac{1+c}{r+c+f} \right\} B_3 \tag{11}$$

or

$$M_1 = m_4 B_3 \ . \tag{11^1}$$

Clearly, $m_1 \neq m_2 \neq m_3 \neq m_4$, except in rare cases when the ratios take on values which make such equalities possible.

The models developed above can, obviously, be multiplied many times over by simply defining M and B in various ways and combining them in different forms. Therefore the value of the multiplier depends on the definitions of money stock and monetary-base which are used in combination to derive the model. Hence, for purposes of empirical analysis and policy-making, it is more important to use the pair of definitions which correctly reflects each country's financial system than to aim at finding a unique and universally applicable numerical value of the money multiplier.

III. THE ROLE OF EXPECTATIONS AND PARTIAL ADJUSTMENT MECHANISMS IN MONETARY-BASE MODELS

In view of the problems raised above it is necessary to modify the static and mechanistic nature and reduce the oversimplifications of the monetary-base models. The introduction of the notion of expectations and partial adjustment mechanisms into the model serves this purpose by adding an element of dynamism and flexibility, and therefore answering some of the criticisms of the simple, naive model.

A simple way of incorporating the role of expectations into monetary analysis is to assume that the desired or expected level of a particular monetary variable of interest is a theoretical magnitude which is not directly observable, and to relate the desired value to the observed value through a specified partial adjustment mechanism.[1] Thus, if we start with a generalized monetary-base model which takes the following form:

$$M_t = m_o + m_1 B_t^* \qquad (12)$$

where m_o represents a constant term which is not constrained to be zero, and m_1 is the multiplier. The presence of the constant term introduces the element of generality in the sense that it captures some of the variability which characterises the multiplier.

Now, if it is assumed that B_t is not directly observable, we can postulate a familiar partial adjustment mechanism which relates the actual and desired values of B_t and takes the form

$$B_t^* = (1 - b)B_t + bB^*_{t-1} \qquad (13)$$

with $0 \leq b \leq 1$

where B_t^* is the desired or expected value of monetary base at period t, and b is the adjustment coefficient which lies between zero and unity. Then by a process of successive substitution and manipulation, equation (13) becomes

$$B_t^* = (1-b)B_t + bB_{t-1} + b^2B_{t-2} + \ldots \qquad (14)$$

Substituting equation (14) into equation (12), we have

$$M_t = m_o + m_1 (1-b)(B_t + bB_{t-1} + b^2B_{t-2} + \ldots + \ldots) \; . \qquad (15)$$

Similarly,

$$M_{t-1} = m_o + m_1(1-b)(bB_{t-1} + b^2B_{t-2} + b^3B_{t-3} + \ldots + \ldots) \; . \qquad (16)$$

Subtracting equation (16) from equation (15) and rewriting, we have

$$M_t = m_o (1-b) + m_1(1-b) B_t + m_1 M_{t-1} \qquad (17)$$

---

[1] This procedure has been popularised by the work of L. M. Koyck, [7].

or

$$M_t = \alpha_o + \alpha_1 B_t + \alpha_2 M_{t-1} \qquad (18)$$

where,

$$\alpha_o = m_o(1-b)$$

$$\alpha_1 = m_1\ (1-b)$$

$$\text{and } \alpha_2 = m_1.$$

Equation (18) which relates money supply at a given time period to the value of base money during the same period and one-period lagged value of money supply represents a more flexible and dynamic restatement of the simple menotary-base model.

The notion of expectations and partial adjustment can also be introduced into the model by operating directly on the component parts of base money. For instance, we can postulate that

$$C_t = cD_t^* \qquad (19)$$

and

$$R_t = r_o + r_1 D_t^* \qquad (20)$$

where D_t^* represents the expected value of deposits and r_o is a constant which takes care of some of the effects of excess reserves. If it is assumed further that

$$D_t^* = (1-d)D_t + dD^*_{t-1} \qquad (21)$$

with $o \leq d \leq 1$,

then, as before,

$$D_t^* = (1-d)(D_t + dD_{t-1} + d^2D_{t-2} + \ldots\ldots) \qquad (22)$$

and hence, substituting for D_t^* from equation (22) into equations (19) and (20);

$$C_t = c(1-d)D_t + cC_{t-1} \qquad (23)$$

and $$R_t = r_o(1-d) + r_1(1-d)D_t + r_1R_{t-1}. \tag{24}$$

When these values are added together to derive B_t, we obtain

$$B_t = r_o(1-d) + (r_1+c)(1-d)D_t + r_1R_{t-1} + cC_{t-1}. \tag{25}$$

Then,

$$D_t = \frac{B_t - \{r_o(1-d) + r_1R_{t-1} + cC_{t-1}\}}{(r_1+c)(1-d)}. \tag{26}$$

Money supply (M_t) is of course the addition of C_t—from equation (23) — and D_t — from equation (26) —i.e.,

$$M_t = \frac{(1+c-cd)[B_t - \{r_o(1-d) + r_1R_{t-1} + cC_{t-1})\}]}{(r_1+c)(1-d)}. \tag{27}$$

Thus,

$$M_t = \beta_o + \beta_1B_t + \beta_2R_{t-1} + \beta_3C_{t-1}. \tag{28}$$

where,

$$\beta_o = \frac{r_o(1-d)}{(r_1+c)(1-d)}; \tag{29}$$

$$\beta_1 = \frac{1+c-cd}{(r_1+c)(1-d)};$$

$$\beta_2 = \frac{r_1(cd-c-1)}{(r_1+c)(1-d)};$$

and

$$\beta_3 = c\left[\frac{cd-c-1}{(r_1+c)(1-d)}\right].$$

This equation says that money supply at period t depends on the cash-base at the same period and the previous period's values of reserves and currency.

Like equation (18), equation(28) presents a more flexible and dynamic formulation of the cash-base model. But these dynamic restatements of the basic model do not, by any means, exhaust the possible ways of modifying the model. The point has, however, been clearly made that the money multiplier approach to money supply determination and control is more versatile and adaptable than is often realized.

IV. PERFORMANCE OF MONEY MULTIPLIER MODELS

Models are built as a means of better understanding and explaining real life phenomena. Hence, the acid test of the usefulness of a model is its ability to predict or forecast real life behaviour. This test is applied to three versions of the money multiplier model which are represented by the following regression equations:

$$M_t = m_o + m_1 B_{1t} + m_2 W_t + m_3 S_1 + m_4 S_2 + m_5 S_3 + u_{1t} \tag{29a}$$

$$M_t = m_o + m_1 B_{2t} + m_2 W_t + m_3 S_1 + m_4 S_2 + m_5 S_3 + u_{2t} \tag{29b}$$

$$M_t = \alpha_o + \alpha_1 B_{1t} + \alpha_2 M_{t-1} + \alpha_3 W_t + \alpha_4 S_1 + \alpha_5 S_2 + \alpha_6 S_3 + v_{1t} \tag{30a}$$

$$M_t = \alpha_o + \alpha_1 B_{2t} + \alpha_2 M_{t-1} + \alpha_3 W_t + \alpha_4 S_1 + \alpha_5 S_2 + \alpha_6 S_3 + v_{1t} \tag{30b}$$

$$M_t = \beta_o + \beta_1 B_{1t} + \beta_2 R_{t-1} + \beta_3 C_{t-1} + \beta_4 W_t + \beta_5 S_1 + \beta_6 S_2 + \beta_7 S_3 + w_{1t}. \tag{31a}$$

$$M_t = \beta_o + \beta_1 B_{2t} + \beta_2 R_{t-1} + \beta_3 C_{t-1} + \beta_4 W_t + \beta_5 S_1 + \beta_6 S_2 + \beta_7 S_3 + w_{2t} \tag{31b}$$

where,

M_t = money supply defined as $C + D$;

B_{1t} = cash-base defined as $C + R$;

W_t = dummy variable for Nigeria's civil war years (1967 to 1970) ;

B_{2t} = cash-base defined as $C + R + TB$;

S_1, S_2 and S_3 = seasonal dummy variables ;

u, v and w = error terms .

Obviously, regression equations (29a) and (29b) correspond to the model represented by equation (12); regression equations (30a) and (30b) correspond to the model in equation (18) and regression equations (31a) and (31b) represent the model in equation (28).

The regression results, which are estimated, using the method of ordinary least squares, on the basis of Nigerian quarterly data[1] for the period 1960 (I) to 1969 (II), are given below ;[2]

Regression Equation (29)

$$M_t = 66.78 + \underset{(5.01)}{1.14\,{}^*B_{1t}} + \underset{(0.02)}{13.99W_t} - \underset{(0.05)}{9.11S_1} - \underset{(0.69)}{14.46S_2} - \underset{(1.67)}{12.79S_3}$$

$\bar{R}^2 = 0.88$; D. W. $= 2.44$

and

$$M_t = 61.55 + \underset{(6.09)}{0.98\,{}^*B_{2t}} - \underset{(3.41)}{23.39{}^*W_t} - \underset{(1.43)}{10.52S_1} + \underset{(1.75)}{16.79S_2} - \underset{(2.47)}{14.11{}^*S_3}$$

$R^2 = 0.92$; D. W. $= 2.42$

Regression Equation (30)

$$M_t = 14.01 + \underset{(11.40)}{0.51{}^*B_{1t}} + \underset{(5.70)}{0.58{}^*M_{t-1}} - \underset{(0.10)}{3.72W_t} - \underset{(0.08)}{3.47S_1} + \underset{(0.03)}{2.09S_2} + \underset{(1.98)}{27.46S_3}$$

$\bar{R}^2 = 0.91$; D. W. $= 2.32$

and

$$M_t = 15.70 + \underset{(12.14)}{0.71{}^*B_{2t}} + \underset{(4.42)}{0.43{}^*M_{t-1}} - \underset{(0.41)}{10.66W_t} - \underset{(0.03)}{6.60S_1} - \underset{(0.07)}{2.53S_2} + \underset{(1.89)}{17.54S_3}$$

$\bar{R}^2 = 0.94$; D. W. $= 2.23$

---

[1] The data for this exercise are taken from various issues of [4].

[2] In the regression results, "t" values are placed in brackets directly below the estimated coefficients to which they correspond, $\bar{R}^2$ stands for adjusted coefficient of determination and D. W. is Durbin—Watson statistic. The star symbols in the regression results indicate those coefficients whose estimates are statistically significant at the 5 per cent level.

Regression Equation (31)

$$M_t = 99.36 + \underset{(10.51)}{1.42^*B_{1t}} + \underset{(4.77)}{1.48^*R_{t-1}} + \underset{(3.04)}{0.21^*C_{t-1}} + \underset{(0.51)}{18.79W_t} - \underset{(0.04)}{39.33S_1}$$

$$- \underset{(0.06)}{42.22S_2} - \underset{(2.93)}{47.53^*S_3}$$

$\bar{R}^2 = 0.90$; D. W. $= 2.07$

and

$$M_t = 58.92 + \underset{(9.59)}{1.06^*B_{2t}} + \underset{(3.91)}{0.78^*R_{t-1}} + \underset{(2.53)}{0.23^*C_{t-1}} - \underset{(0.03)}{9.64W_t}$$

$$- \underset{(1.26)}{27.40S_1} - \underset{(0.03)}{26.06S_2} - \underset{(1.59)}{16.53S_3}$$

$\bar{R}^2 = 0.94$; D. W. $= 2.11$

These results indicate that:

(a) the models provide a good fit for the data; i. e., the cash-base models form a generally good approach for "explaining" variations in money supply since the $\bar{R}^2$ values are uniformly high;

(b) the introduction of expectations and partial adjustment improves the explanatory powers of the models since $\bar{R}^2$ values for regression equations (30) and (31) are higher than those of regression equation (29);

(c) the equations which include B_{2t} as an explanatory variable perform much better than those that include B_{1t} ; this supports the view that for Nigeria, a correct definition of base money must include treasury bills held by commercial banks;

(d) as the theoretical models lead us to expect, the numerical values of the money multiplier differ from model to model and respond not only to the definitions of M and B but also vary with the other explanatory variables included in the models.

Given that we have successfully made the case for the inclusion of expectations in the cash-base model for the period covered by our sample i.e., 1960 (I) to 1969 (II), we can now examine the ability of the three versions of the model to predict future values of money supply. This is done by measuring the forecasting accuracy of the models given by the percentage deviation of predicted values of money supply from the actual values for the period 1969(III) to 1971(II). The relevant figures are shown on table I.

These figures indicate that the simple model represented by regression equation (29) has relatively large deviations—ranging from 4 per cent to over 6 per cent.

TABLE I

PERCENTAGE DEVIATION OF PREDICTED FROM ACTUAL MONEY STOCK VALUES: 1969 (III) TO 1971 (II)

Time	Equation	29	30	31
1969	III	5.02	—0.81	—1.65
	IV	5.73	0.02	1.34
1970	I	4.31	0.22	1.15
	II	5.45	—0.23	—0.03
	III	6.23	2.48	—0.53
	IV	6.00	0.78	—1.13
1971	I	5.71	0.90	0.13
	II	5.05	1.02	1.27

In comparison, the more dynamic models represented by equations (30) and (31) give much better results; their deviations range from —0.81 per cent to 2.5 per cent, and —1.65 per cent to 1.34 per cent respectively. This is, again, a confirmation of our hypothesis that the introduction of expectations and partial adjustment processes significantly improves the predictive performance of the monetay-base models.

V. CONCLUSION

This paper has shown that modified versions of the money multiplier model provide an adequate framework for explaining variations in money supply. The ability to predict future values of money supply should help the policy-maker to control changes in money supply by setting the appropriate values for the variables—base money, reserves and currency—which determine the value of money supply. The money multiplier approach thus provides a fairly simple mechanism through which the monetary authorities can regulate the amount of money supply in the economy.

REFERENCES

1. Ajayi, S. Ibi, "A Critique of the Money Multiplier Approach to Money Supply Determination", *Nigerian Journal of Economic and Social Studies*, Vol. 14, No. 2, July 1972.

2. Andersen, Leonall C., "Three Approaches to Money Stock Determination". *Review* of Federal Reserve Bank of St. Louis, August 1968.

3. Cagan, Phillip, *Determinants and Effcets of Changes in the Stock of Money, 1875—1960*, (Princeton : Princeton University Press, 1965).

4. Central Bank of Nigeria, *Economic and Financial Review*, (various issues).

5. Friedman, Milton and Schwartz Anna J., *A Monetary History of the United States, 1867—1960*, (Princeton: Princeton University Press, 1963).

6. Johnson, Harry G., "Monetary Theory and Policy" in his *Essays in Monetary Economics*, (London: George Allen & Unwin Ltd., 1967).

7. Koyck, L.M., *Distributed Lags and Investment Analysis*, (Amsterdam : North Holland Co., 1954).

8. Oyejide, T. Ademola, "Deficit Financing, Inflation and Capital Formation: An Analysis of the Nigerian Experience, 1957-1970", *Nigerian Journal of Economic and Social Studies*, Vol. 14, No. 1, March 1972.

Aspects of the Management of Nationalised Industries in Bangladesh*

by

QAZI KHOLIQUZZAMAN AHMAD**

I. INTRODUCTION

A very large proportion of the large-scale industrial sector in Bangladesh is under public ownership and management.[1] The nationalised industries sector, therefore, has a crucial role to play in the economic development of the country. It is major responsibility of the Government to make sure that nationalised industries are managed efficiently. However, these industries are currently afflicted with numerous problems with regard to institutional arrangements,policy framework and financial and physical facilities. In this paper, we propose to discuss present institutional arrangements, criteria for performance evaluation and investment and pricing policy with a view to identifying weaknesses therein and suggesting policy changes for the purpose of achieving efficient management of the industries.

---

*This is a revised version of a paper presented at the workshop on "Problems and Prospects of Nationalised Industries of Bangladesh," organised jointly by the Bangladesh Institute of Development Studies and the Bangladesh Economic Association held in Dacca, May 25, 1974.

**The author is a Research Economist at the Bangladesh Institute of Development Studies. He has benefited from discussions with Dr. Abdul Ghafur, Research Economist, BIDS and Mr. Delawar Hussain and Dr. Habibur Rahman, Chairmen of Food and Allied Industries Corporation and Mineral, Oil and Gas Corporation respectively. Dr. Abdur Rab, Section Chief, Planning Commission, Government of Bangladesh, Dr. M. Alamgir, Senior Research Economist, BIDS and Mr. Asaduzzaman, Research Economist, BIDS have read the paper and offered very helpful comments. The author is thankful to all of them. The workshop discussions have also been useful. However, the sole responsibility for the analyses presented and views expressed rests with the author alone.

[1] It may be noted that, of the industries under public management, three (namely jute, cotton textile and sugar) are nationalised while others have been taken over for management. Operationally, however, there has been no difference so far between the nationalised and taken over sectors, although clearly there is a legal difference in terms of status between them. In this paper, the phrase "nationalised industries sector" is used to include both nationalised and taken over units.

II. BACKGROUND TO NATIONALISATION, IMPORTANCE OF THE SECTOR AND ITS CURRENT PERFORMANCE

Background to Nationalisation and Importance of the Sector

In Bangladesh, the manufacturing sector contributes about 10% of the GDP, of which the share of large-scale manufacturing industries is about 6%. From a negligible level at the time of Pakistan's birth, large-scale manufacturing in Bangladesh made significant progress by the end of 1960's. Income originating from this sector, at constant 1959/60 factor cost, was only Tk. 6.9 crore in 1949/50, but rose to Tk. 40.6 crore by 1959/60 and to Tk. 99.1 crore by 1968/69 [4; p. 167].

In Pakistan, the basic tenet of industrialisation was to develop through private enterprise; but the growth of private capitalism was primarily state sponsored. Extremely generous public patronage was available to private initiative in setting up of industrial enterprises by way of financing and guidance from the erstwhile East Pakistan Industrial Development Corporation (EPIDC), National Investment Trust, Pakistan Industrial Credit and Investment Corporation, Industrial Development Bank of Pakistan etc. In some cases, the share of the private entrepreneur in the finances needed to set up jute mills was as low as 10% .On an average, private sponsors contributed about 24% of the investment costs of projects while about 19% came from public equity participation and about 58% from public loan advances [7]. Also, in view of shyness of private capital, the government established enterprises in different sectors with a view to transfering them to the provate sector once profitability was ensured. An example of such disinvestment was the Chandraghona Paper Mills. Moreover, easy profits were available to private capitalists due to generous concessions in taxes, fares etc., underpricing of inputs and overpricing of output through the manipulation of the instruments of direct control on trade and economic activity and export bonus arrangements. The result was that the private capitalists took a relaxed attitude towards effective management and productivity growth. Hence, the large-scale industry, while highly profitable to private capitalists, was grossly inefficient and of relatively small value to the society.[1]

---

[1] See [2] for productivity trends during 1960's in four selected manufacturing industries of Bangladesh and [5] for an analysis of the nature of industrial growth in Bangladesh during Pakistan days.

The ownership of industrial assets was mostly with Pakistanis. In the Pakistani enterprises, management personnel and skilled workers were primarily Pakistanis. Up to the mid 1960's, whatever Bangalee industrial interests developed were mostly in small and medium industries. It is only during the latter half of the 1960's that Bangalee entrepreneurship began to extend to larger industrial ventures. At the time of liberation, about 66% of fixed assets in the jute manufacturing industry, about 47% of fixed assets in the cotton textile industry and all but 6 of the enterprises with assets above Tk. 2.5 million in other sectors were in the ownership of non-Bangalees [7]. This, in brief, is the nature of industrial growth and its ownership pattern in pre-liberation Bangladesh. On liberation of Bangladesh, Pakistanis left the country abandoning their industrial enterprises.

In the post-liberation Bangladesh, a radical change emerged in the whole pattern of industrial ownership. The government took over all units abandoned by Pakistanis in all sectors and nationalised jute, cotton textile and sugar industries, and established sector corporations to control, coordinate and supervise enterprises placed under them. About 85% of the assets in the modern industrial sector is now under public ownership and management. Different kinds of industries are included in the nationalised sector : local consumption goods industries (e.g.,cotton textile, sugar, food and allied goods etc.),local market input supplying industries (e.g., fertilizer, cement, gas etc.), export industries (e.g., jute manufacturing and tanneries), domestic raw-materials-based industries (e.g., jute manufacturing, tanneries, sugar etc.) and imported raw-materials-based industries (e.g., cotton textile, steel etc.).[1] Thus, the nationalised industries sector holds a very sensitive position in the economic structure of the country. Efficient management of the sector can be achieved through (a) an appropriate industrial development strategy, (b) a well designed management structure and (c) an appropriate management policy framework for the sector. Since each industry has special characteristics and problems, the policy and structural

---

[1] As in most other countries, basic utility industries such as electricity, gas, post, railway etc. have always, in pre-as well as post-liberation days, been in the public sector. Also since liberation, banks and insurance companies have been nationalised. However, these are outside the scope of this paper. We are concerned here with ordinary productive industries, mentioned in the text above, which are now under public ownership and management, and which we call "nationalised industries sector."

framework should be so designed as will allow effecient tackling of each industry's special problems. This paper is concerned with (b) and (c), overleaf and not with (a), although its findings will be helpful in designing an appropriate industrialisation strategy.

The Current Performance

Production has increased in certain sectors, but, in many cases, average cost has exceeded the sale price. In such cases, government had to provide easy bank loans or indirect subsidies to keep production going.[1] Thus, while some of the sectors have done fairly well, the overall financial performance of the sector is very poor. The social return of the sector may even be worse. The main reasons for this are power failure, shortage of imported raw materials and spare parts, law and order situation, financial indiscipline and inefficient institutional arrangements [3 ; p. 2].

Performance data in terms of output may depict a somewhat hopeful, but still a very unsatisfactory picture. On the basis of data, presented in table I, one can make the following observations.

(i) In a number of cases, output in 1973/74 exceeded 1969/70 level. These include cloth (by 35%), steel (by 36%), diesel engine (by 33%), shipbuilding (by 352%), heavy vehicles (by 354%), motor cycles (by 101%), bicycles (by 30%), cement (by 31%), oil products (by 73%), fertilizer (by 191%) and OLP (by 22%).

(ii) Except in electric cables and wire, newsprint, tobacco, chemicals, glass and injectables, all other sectors recorded an expansion in output between 1972/73 and 1973/74.

(iii) Except in jute goods and cotton textiles, most of the products in all other sectors recorded an expansion in output between July-December, 1973 and January-June, 1974.

---

[1] During 1973/74, expansion of bank loans in nationalised industries was Tk. 115·93 crore [3; p. 2] and Tk. 1075 crore was paid to the Jute Industries corporation as direct subsidy [3; p. 3] .

(iv) The two largest sectors, jute and cotton textiles, have tended to lag behind. Although, some improvement in the production of these products has taken place in 1973/74 in relation to 1972/73, jute goods output in 1973/74 was still only about 81% of 1969/70 level and cotton yarn about 86%. This together with the fact that production of electric cables and wire, newsprint, tobacco, chemicals, glass and injectables recorded a definite downturn between 1972/73 and 1973/74, indicates a frustrating situation.

(v) Although, some industries have done quite well, the overall performance of the nationalised sector is far from satisfactory. Moreover, it is suspected that productive efficiency has declined in all the industries.

TABLE I

PRODUCTION IN SELECTED PUBLIC SECTOR INDUSTRIES OF BANGLADESH (1969/70, 1972/73 AND 1973/74)

Sl. No.	Group of Industries (1)	Unit (2)	Capacity in 1972/73 (3)	Capacity in 1973/74 (4)	Production in 1969/70 (5)	Production in 1972/73 (6)
1.	**Jute**	Tons	7,07,712	7,07,712	5,87,487	4,46,348
2.	**Textile:**					
	(a) Yarn	Lakh lbs.	1,344	1,937	1,056	808.53
	(b) Cloth	Lakh yds.	1,212	1,308	588	589.52
3.	**Sugar**	Tons	1,69,000	1,69,000	93,760	19,335
4.	**Steel** (ingot)	Tons	2,50,000	2,50,000	54,138	67,917
5.	**Engineering and Shipbuilding:**					
	(a) Diesel Engines	No.	3,000	3,000	1,284	1,353
	(b) Shipbuilding	(i) Lakh Taka in current prices		1,000	108.00	159.40
		(ii) Tons			11,759	8,181
	(c) Pumps	No.				900
	(d) Heavy Vehicles (bus, truck, car)	No.		3,000	455	1,228

(contd.)

TABLE I (*contd.*)

Sl. No.	Group of Industries	Unit	Capacity in 1972/73	Capacity in 1973/74	Production in 1969/70	Production in 1972/73
	(1)	(2)	(3)	(4)	(5)	(6)
	(e) Motor Cycles	No.	4,500	4,500	935	1,729
	(f) Bicycles	No.		30,000	7,295	7,448
	(g) Electric Cables and Wire	Tons	3,350	3,350		521
	(h) G. I. and Steel Pipe	Tons	26.67 (cft)	6,300	5,134	2,800
6.	**Newsprint and Paper:**					
	(a) Paper	Tons	30,000	50,400	30,753	20,768
	(b) Newsprint	Tons	40,000	40,000	35,700	27,493
7.	**Cement**	Tons	1,50,000	1,50,000	40,000	32,000
8.	**Food & Allied Products:**					
	(a) Tobacco	Lakh sticks	63,900	63,900	12,411	11,438
	(b) Oil Products	Tons	41,818	48,833	10,705	14,091
	(c) Food Products	Tons	59,400	59,400		26,875
	(d) Fish Processing	Lakh lbs.	128	128	37	23
	(e) Beverage	Lakh lbs.	86.4	86.4		39.6
9.	**Fertilizer, Chemicals and Pharmaceuticals:**					
	(a) Chemicals	Tons	22,851	22,851		3,046
	(b) Glass	Lakh sft.	.75	.75	73	72.4
	(c) Fertilizer (urea)	Tons	4,46,000	4,46,000	95,917	2,25,833
	(d) Pharmaceuticals:					
	(i) Tablets	Lakh No.	4,820	4,820	3,966	1,213
	(ii) Injectables	Lakh ample	36	36	35	9
	(iii) OLP	Lakh bottle	65	65	37	29
	(iv) Capsules	Lakh No.	192	192	171	89
10.	**Tannaries:**					
	(a) Cow Hides	Th. pieces		1,872		386
	(b) Goat Skins	Th. Pieces		18,720		1,824

(contd.)

TABLE I (*contd.*)

Sl No.	Group of Industries	Unit	Production in 1973/74	Production in 1972/73 as Percentage of Production in 1969/70	Production in 1973/74 as Percentage of Production in 1969/70	Production in 1973/74* as Percentage of Production in 1969/70
			(7)	(8)	(9)	(10)
1.	**Jute**	Tons	5,00,446	76	112	85
2.	**Textile:**					
	(a) Yarn	Lakh lbs.	913	77	112	86
	(b) Cloth	Lakh yds.	794	100	135	135
3.	**Sugar**	Tons	88,395	21	457	94
4.	**Steel** (ingot)	Tons	73,669	125	108	136
5.	**Engineering and Shipbuilding:**					
	(a) Diesel Engines	No.	1,720	105	127	133
	(b) Shipbuilding	(i) Lakh Taka in current prices	487.78*	147	307	452
		(ii) Tons	10,254	70	125	87
	(c) Pumps	No.	2,034.55*		226	
	(d) Heavy Vehicles (bus, truck, car)	No.	2,068	270	168	454
	(e) Motor Cycles	No.	1,886	185	109	201
	(f) Bicycles	No.	9,497	102	127	130
	(g) Electric Cables and Wire	Ton	463		88	
	(h) G. I. and Steel Pipe	Ton	3,661	55	130	71
6.	**Newsprint and Paper:**					
	(a) Paper	Tons	23,655	68	115	76
	(b) Newsprint	Tons	26,464	77	96	74
7.	**Cement**	Tons	52,449	80	163	131

(contd.)

TABLE I (*contd.*)

Sl No.	Group of Industries	Unit	Production in 1973/74 (7)	Production in 1972/73 as Percentage of Production in 1969/70 (8)	Production in 1973/74 as Percentage of Production in 1969/70 (9)	Production in 1973/74* as Percentage of Production in 1969/70 (10)
8.	**Food & Allied Products:**					
	(a) Tobacco	Lakh sticks	10,400	92	90	83
	(b) Oil Products	Tons	18,532	131	131	173
	(c) Food Products	Tons	33,889*		126	
	(d) Fish Processing	Lakh lbs.	31	62	135	84
	(e) Beverage	Lakh lbs.	42.39*		107	
9.	**Fertilizer, Chemicals and Pharmaceuticals:**					
	(a) Chemicals	Tons			93	
	(b) Glass	Lakh sft.	57	99	79	78
	(c) Fertilizer (urea)	Tons	2,79,000	235	124	291
	(d) Pharmaceuticals:					
	(i) Tablets	Lakh No.	1,977	31	163	50
	(ii) Injectables	Lakh ample	9	26	100	26
	(iii) OLP	Lakh bottle	45	78	155	122
	(iv) Capsules	Lake No.		52	109	57
10.	**Tannaries:**					
	(a) Cow Hides	Th. pieces	160.8		42	
	(b) Goat Skins	Th. pieces	1,123.1		62	

(contd.)

TABLE I (*contd.*)

Sl. No.	Group of Industries	Unit	Monthly Average Production in 1969/70 (11)	Monthly Average Production in 1972/73 (12)	Monthly Average Production during 1973/74 (13)	Monthly Average Production Jan.-June, 1974 (14)
1.	**Jute**	Tons	48,957	37,196	41,704	40,566
2.	**Textile:**					
	(a) Yarn	Lakh lbs.	88	67.42	76.08	73.16
	(b) Cloth	Lakh yds.	49	49.17	66.16	65.73
3.	**Sugar**	Tons	7,813	1,611	7,366.25	10,008.50
4.	**Steel** (ingot):	Tons.	4,511.50	5,660	6,139.08	7,308.16
5.	**Engineering and Shipbuilding:**					
	(a) Diesel Engines	No.	107	113	143	158
	(b) Shipbuilding (i)	Lakh Taka in current prices	9.00	13.25	40.64	51.78
	(ii)	Tons	980	682		
	(c) Pumps	No.		75	170	
	(d) Heavy Vehicles (bus, truck, car)	No.	38	102	172	
	(e) Motor Cycles	No.	78	144	157	
	(f) Bicycles	No.	608	621	791	
	(g) Electric Cables and Wire	Ton		43.41	38.58	
	(h) G. I. and Steel Pipe	Ton	428	233	305.08	
6.	**Newsprint and Paper:**					
	(a) Paper	Tons	2,563	1,731	1,971.25	1,848.50
	(b) Newsprint	Tons	2,975	2,291	2,205.33	2,399.66
7.	**Cement**	Tons	3,333	2,667	4,370.75	6,924.83
8.	**Food & Allied Products:**					
	(a) Tobacco	Lakh sticks	1,034.25	953.17	866.66	1,038.50
	(b) Oil Products	Tons	892.08	1,174.25	1,544.33	1,681.0

(contd.)

TABLE I (*contd.*)

Sl. No.	Group of Industries	Unit	Monthly Average Production in 1969/70	Monthly Average Production in 1972/73	Monthly Average Production during 1973/74	Monthly Average Production Jan.-June, 1974
			(11)	(12)	(13)	(14)
	(c) Food Products	Tons		2,239.6	2,824.08	3,118.17
	(d) Fish Processing	Lakh lbs.	3.08	1.92	2.58	.85
	(e) Beverage	Lakh lbs.		3.30	3.53	3.20
9.	**Fertilizer, Chemical and Pharmaceuticals:**					
	(a) Chemicals	Tons		353.83	235.33	262.00
	(b) Glass	Lakh sft.	6.08	6.03	4.75	4.98
	(c) Fertilizer (urea)	Tons	7,993.08	18,819.4	23,250	23,681.83
	(d) Pharmaceuticals:					
	(i) Tablets	Lakh No.	330.50	101.08	164.75	151.90
	(ii) Injectables	Lakh ample	2.92	.75	.75	1.07
	(iii) OLP	Lakh bottle	3.08	2.42	3.75	3.81
	(iv) Capsule	Lakh No.	14.25	7.42	8.09	9.52
10.	**Tannaries:**					
	(a) Cow Hides	Th. pieces		32.17	13.40	
	(b) Goat Skins	Th. pieces		152	93.59	

(contd.)

TABLE I (*contd.*)

Sl. No.	Group of Industries	Unit	Monthly Average Production July-Dec. 1974 (15)	Capacity Utilization in 1969/70 (in percentage) (16)	Capacity Utilization in 1972/73 (in percentage) (17)	Capacity Utilization in 1973/74*(in percentage) (18)
1.	**Jute**	Tons	42,842	74	63	71
2.	Textile:					
	(a) Yarn	Lakh lbs.	79.01	79	60	47
	(b) Cloth	Lakh yds.	66.60	49	49	60
3.	**Sugar**	Tons	4,724	55	11	52
4.	**Steel** (ingot)	Tons	4,970	22	27	29
5.	**Engineering and Shipbuilding :**					
	(a) Diesel Engines	No.	129	43	45	57
	(b) Shipbuilding	(i) Lakh Taka in current prices	29.52			49
		(ii) Tons				
	(c) Pumps	No.				
	(d) Heavy Vehicles (bus, truck, car)	No.				68
	(e) Motor Cycles	No.			38	41
	(f) Bicycles	No.				31
	(g) Electric Cables and Wire	Ton			15	13
	(h) G. I. and Steel Pipe	Ton			?	58
6.	**Newsprint and Paper:**					
	(a) Paper	Tons	2,094	102	69	46
	(b) Newsprint	Tons	2,011	80	69	66
7.	**Cement**	Tons	1,816.66	27	21	34

(contd.)

TABLE I (*contd.*)

Sl. No.	Group of Industries	Unit	Monthly Average Production July-Dec. 1974 (15)	Capacity Utilization in 1969/70 (in percentage (16)	Capacity Utilization in 1972/73 (in percentage) (17)	Capacity Utilization in 1973/74* (in percentage) (18)
8.	**Food & Allied Products**					
	(a) Tobacco	Lakh sticks	694.83	48	18	16
	(b) Oil Products	Tons	1,407.7	31	23	33
	(c) Food Products	Tons	2,530		45	57
	(d) Fish Processing	Lakh lbs.	4.32		18	24
	(e) Beverage	Lahk lbs.	3.87	63	46	49
9.	**Fertilizer, Chemicals and Pharmaceuticals:**					
	(a) Chemicals	Tons	208.67		13	12
	(b) Glass	Lakh sft.	4.52	63	97	76
	(c) Fertilizer (urea)	Tons	22,818	91	51	63
	(d) Pharmaceuticals:					
	(i) Tablets	Lakh No.	177.61	10	25	41
	(ii) Injectables	Lakh ample	.43	115	25	25
	(iii) OLP	Lakh bottle	3.69		45	69
	(iv) Capsules	Lakh No.	6.65		46	51
10.	**Tannaries:**					
	(a) Cow Hides	Th. pieces				9
	(b) Goat Skins	Th. pieces				6

*Estimated by assuming June '74 production equals average monthly production during January-May '74 and, wherever breakdown was not available, during July '73-May '74.

Note: In Engineering and Shipbuilding sector, capacity shown is on one shift basis. In all other sectors, it is on three-shift basis.

Source: First Five Year Plan and Industry Division of the Planning Commission.

III. THE STRUCTURE OF MANAGEMENT OF NATIONALISED INDUSTRIES SECTOR

Existing Arrangement and Problems Therein

As mentioned in the last section, industrial production in Bangladesh was mainly in the hand of private entrepreneurs; and the government involvement in this field was limited to regulatory and promotional activities. Even the erstwhile EPIDC was basically promotional in nature—its direct productive undertakings were for eventual disinvestment to the private sector. The nationalisation programme has brought in a completely new dimension in the governmental responsibility in the productive field.

The system adopted for the management of nationalised industries in Bangladesh is a three-tier system: the Minister-in-Charge, Sector Corporations and enterprise managements. The governmental authority for managing a nationalised industry vests in the Minister-in-Charge, who acts as the owner of the industry on behalf of the people. He is responsible for the working of the industry to the Parliament and, through it, to the people.

Corporations, known as sector corporations, run the industries under the supervision of the Minister-in-Charge and are responsible to him. These corporations have been created as government bodies for "control, coordination and supervision" of enterprises respectively placed under them, and to exercise such powers of the government as the government may delegate.[1]

Enterprises, which are the productive industrial units, are owned by respective corporations[2] and are run by enterprise managements under the control of these corporations. Enterprise managements are appointed by respective corporations to run the enterprises and enjoy such powers and operational freedom as are granted to them by corporations.

---

[1] Article 17 (a) as amended by P. O. No. 131 and 17 (c) of the Nationalisation Order (President's Order No. 27).

[2] The term 'corporation', unless otherwise qualified, will refer to sector corporations.

Regarding the relationship between the three-tiers of management, clear cut demarcation of responsibilities has not yet been formulated. The present arrangements are full of conflicts and confusions. Without proper responsibility budgeting, the principle of accountability cannot be implemented.

Corporations are the central organisations in the present management structure of the nationalised industries. The main responsiblity for running the nationalised industries devolves on them. Corporations are the commercial units since they, as guardians of assets of the enterprises placed under their respective control, are responsible for ensuring that the overall targets and objectives of the nationalised industries are achieved. It has been proposed [6; p. 252] that corporations should enjoy maximum commercial autonomy, but its operational meaning has not been spelt out.

Currently, there are 11 sector corporations covering the nationalised modern industrial sector with specific groups of industrial units placed under each: Jute Industries, Textile Industries, Sugar Mills, Paper and Board, Food and Allied Industries, Steel Mills, Mineral, Oil and Gas, Engineering and Shipbuilding, Fertilizer Chemical and Pharmaceutical, Tanneries and Forest Industries. There are now three cabinet Ministers in charge of sector corporations: the Minister for Jute Affairs, assisted by a State Minister for jute and jute industries, is in charge of Jute Industries Corporation, the Minister for Natural Resources, Scientific and Technical Research and Atomic Energy is in charge of Mineral, Oil and Gas Corporation and the Minister of Industries, assisted by State Minister for Nationalised Industries, control all other corporations.

The Jute Industries Corporation has direct access to the Minister-in-Charge with the Chairman of the corporation acting as secretary to the Ministry. This Corporation operates directly with other Ministries. Other corporations, under current arrangements, do not have direct access to the Minister, neither can they deal directly with other ministries. The affairs of the Mineral, Oil and Gas Corporation are handled by the Natural Resources Division (NRD) of the Ministry of Natural Resources, Scientific and Technical Reserach and Atomic Energy and the affairs of other corporations are handled by the Nationalised Industries Division (NID) of the Ministry of Industries. That is, NRD and NID, both headed by department secretaries, act as secretariats for the respective corporations. The Chairmen of these corporations do not have the rank and status of a departmental secretary.

To analyse the current institutional arrangements profitably, it is necessary to understand the role and nature of the sector croporations. The corporations, having been entrusted with ownership control over productive units, are oriented towards production and directly productive investments. Traditionally, public corporations have been mostly either service oriented such as Bangladesh Road Transport Corporation, Bangladesh Consumer Supplies Corporations etc. or promotional in nature such as Bangladesh Agricultural Development Corporation, Bangladesh Housebuilding Finance Corporation etc. Again, while traditional public corporations are executive in nature, sector corporations are controlling in nature.

In practice, through NID and NRD, sector corporations are subject to the same process of bureaucratic control as the traditional public sector which by definition is rigid and ponderous, while, in business and productive activities, flexibility and quickness are inalienable characteristics of the decision making process. There seems to be a contraditction in that, while sector corporations, as government bodies, are respnonsible to the government for the perfomance of productive units placed under them, they themselves are subject to bureaucratic control which would seem to be inconsistent with the role that they have been created to perform. It is indeed a common complain of the concerned corporations that the channeling of matters through NID and NRD is a lengthy process involving costly delays and bottlenecks. This is particularly serious in regard to matters involving other ministries. Indeed, a sector corporation comes under the purview of several ministries in addition to its controlling ministry at one point or another—the ministries involved in a major way being the Ministry of Planning, the Ministry of Finance, the Ministry of Commerce and the Ministry of Labour.

Again, the sector corporations have been equated with regular civil government departments in the matter of recruitment by subjecting them to the same pay and service structure in the case of officers and staff and a rigid wage structure in the case of workers. Their operational "autonomy" in the matters of procurement and sale also is limited. For purchases above Tk. 10 lakh, excepting purchase from other government agencies, prior permission of the Cabinet Sub-Committee has to be obtained. For import, the same licensing control as is applicable to the private sector, is operative for the corporations also. Regarding sales, with the exception of export industries, e.g., jute and tanneries, all other nationalised industries are subject to price control of various degrees. Thus, while the corporations do not have the operational 'freedom' in recruitment, procurement, sales etc. enjoyed by the private sector, they remain equated with the private sector for regulatory controls in regard to imports, duties, taxes etc.

Enterprises are to function under the guidance, supervision and control of the respective corporations, but what freedom of action, if any, an enterprise will enjoy has not been defined. While the lack of authority is resented by enterprise management, it is also used by them as an escape clause for defaults in performance. Indeed, enterprises are the productive units and, hence, the need for authority of decision making and implementation is very great at that level. Under the present arrangement, this crucial point has been missed. It is argued, however, that corporations will delegate authority to enterprises as and when 'right' enterprise managements will be there to take the responsibility. It is further argued that currently shortage of qualified managers seriously limits that possibility. In practice, corporations have tended to hold on to whatever authority and operational freedom have been granted to them, and very little delegation of authority to enterprises has taken place. Moreover, it is the Chairman of the corporation on whom all the authority vests. Directors of corporations, under current terms and conditions of their job, are working merely as advisors of the Chairman and enjoy such authority as the Chairman may delegate to them. Thus, one man has all the authority to manage the enterprises under his control and it is he who has to decide how much of his authority he should or should not delegate to his Directors and to enterprise managements. In practice, very little delegation of authrotiy even to Directors has so far taken place in any corporation. Furthermore, rules of business for the nationalised sector are yet to emerge—even after over two years of nationalistaion. Hence, confusions and adhoc arrangements continue to be the dominating feature.

As a result of all this, "all the indurstries are suffering from management and communication problems. Inefficient and unmotivated functionaries are taking advantage of the situation; and competent people do not have an effective framwork to make determined efforts. The net result is that corporations are not able to provide effective guidance to enterprises nor can they effectively tackle the problems of enterprises and keep watch on their performance" [1; p. 7].

Suggestions for Improving the Institutional Structure and the Policy Framework

It appears that there is a lack of proper realization on the part of the government of the dimension and intensity of its production responsibility consequent upon the nationalisation programme. Traditionally, the government performed civil and military functions as its regular areas of direct responsibility while, in production, the government's role was basically regulatory and promotional. This traditional attitude towards production management of government departments and agencies within whose purview activities relating to production come at one point or another has continued to persist over the past years. This was a major reason for many problems and confusions regarding institution building and policy formulation for the management of the nationalised industries. In order to create conditions for evolving an effective institutional structure and a sound policy framework for the nationalised sector, it is essential to break away from this 'tradition.' Production in the nationalised sector is a direct governmental function and it must be so accepted in letter and spirit. Rules of business have to be formulated accordingly, but with due emphasis on the nature and characteristics of productive activities.

In production management, flexibility in the policy framework and procedural requirements and quick decisions and actions are of fundamental importance as the key to success here is dynamic exploitation of changing market and technological conditions. Market conditions are forever changing and quick and appropriate adjustments in production plans and procurement and sale strategies are needed to take advantage of favourable changes and guard against unfavourable ones. The management must also be in a flexible position to take advantage of opportunities suddenly showing up for innovative drives or productivity improvement. All this means that managements should enjoy maximum freedom of action in respect of production, procurement, sales, recruitment, dismissal etc., albeit within the framework of socio-political objectives of the state. That is, institutional structure, policy frame work and rules of business for the government's production function should be so designed as to allow maximum operational freedom to the management system, with minimum regulatory control.

That maximum commercial freedom should be available to corporations has been proposed in the First Five Year Plan [p. 252] ; but, in practice, as we have seen, they have been granted very little freedom of action. It is to be noted that the plan has proposed maximum commercial freedom for the corporation, leaving the delegation of authority to the enterprises at the discretion of the corporation Chairman. We do not agree with this proposal in view of the problems, which may arise with regard to the delegation of authority to enterprises. Enterprises as the productive units should be the focus for decentralization of authority. In other words, our contention is that enterprises should be the commercial units rather than corporations which, with the responsibility of manning and running their enterprises, are the primary commercial entities under the present set-up.

Our recommendation is that enteprises should derive necessary authority and operational freedom directly as commercial units. This will ensure that authority and operational freedom will devolve to the level where these are actualy needed. This will make enterprise managements more responsible and the accountability and follow-up action at the enterprise level, where it matters most, can be more easily and effectively implemented. Also, since, under our proposal, enterprises will no longer be mere subordinates of controlling bodies (i. e., corporations), acting as directed, but will each be an autonomous unit, the enterprises in each industry are likely to compete more with one another for better performance than may be the case under the present arrangement in which they have no national identity and no direct national responsibility.

Two questions arise immediately from the proposal of autonomous enterprises. One relates to the status and responsibility of the corporations and the other to the feasibility of decentralization of authority to enterprises. Let us deal with them in turn.

The corporations will no longer remain controlling bodies as they are at present. They will now be primarily coordinating bodies and will also supervise the enterprises on behalf of the Minister-in-Charge who is ultimately responsible for the performance of nationalised industries, acting as the owner on behalf of the people. Their functions will include (a) working out guidelines for the enterprises to operate within the socio-political objectives of the state; (b) all coordinative functions between enterprises on the one hand and different concerned ministries on the other ; (c) all such functions for the enterprises where there are significant advantages of industry level action in terms of cost and effectiveness e.g., export promotions for jute goods; (d) all development work such as balancing, modernisation or expansion of existing enterprises (in collaboration with enterprise managements) and development of new enterprises and (e) any other functions specifically assigned to them by the minister.

Thus, under the proposal, corporations, which may even be renamed as Divisions, no longer owners of enterprises, will be supervising the activities of autonomous productive units. Hence, bureaucratic control over corporations such as NID and NRD, will be unnecessary, and perhaps even be harmful being and additional control tier.

A few words regarding the status and appointment of corporation and enterprise executives may be in order here. Status is an extremely important element in our administrative structure and, hence, corporation executives should have appropriate status so that they can function effectively. The chief excutives of corporations, should have the status of departmental secretaries for them to be able to perform their duties effectively. The system of command in these bodies will remain the present Board system, as corporate setup is the more effective form of command in production management, so that there will be Directors, who should have the status of a regular Joint Secretary. But these Directors will have their functional responsibilities clearly defined rather than the present adhoc nature of their responsibilities, assigned at the pleasure of the Chairman. The chief executive, who will act as Minister's secretary and chairman of the Board, as well as the Directors will be appointed by the Cabinet on the recommendation of the Minister-in-Charge. In the selection of Directors, the Minister-in-Charge may be assisted by the Chairman. The Chairman and Directors should be professionally qualified and experienced persons and not bureaucrats. Modalities for appointment below this may be worked out on the basis of regular government practices and considerations of needed flexibility and quickness of actions in production management. Since people with specialised skills and knowledge will be needed, the Chairman and Directors will be the best judges ; and they should have necessary power for the appointment of the right people, to be automatically ratified by the appropriate governmental machinery.

Chief executives of enterprises, which are now the commercial units, should also be granted appropriate status for them to function effectively. They may also be helped by appropriately constituted management Boards which may include departmental chiefs in the enterprises and representatives from corporations. The enterprise managements will be appointed by the Minister-in-Charge on the advice of relevant Boards of Directors.

Regarding the feasibility of decentralizations of authority to enterprises, it is argued that shortage of managerial and technical expertise is currently very acute and, hence, there is only limited scope for delegation of authority to enterprises. Shortage of human resources is indeed a major problem. But, corporation officials located mostly in Dacca find it extremely exhausting, and even unmanageable, to control enterprises scattered all over the country. They have to depend on the people in charge of the enterprises. Yet, over the past years, corporations have taken very little interest in skill development ; and very little progress towards delegation of authority to enterprises has taken place.

Now, while it is true that many enterprises, are, of necessity, being run with poorly qualified people, there are many excellent managers and technicians in all the industries. If need be, it may be possible to put an experienced manager in charge of 2 or 3 smaller units within easy reach of each other with a deputy helping him in each case. In jute industry, for example, there are several excellent managerial experts now doing desk work in corporation offices. Under decentralization policy and given right atmosphere in mill sides, they might want to go back to the field. It would seem reasonable to argue that many more enterprises, than would appear possible at first look could be placed immediately in reasonably good hands if genuine efforts are made. Moreover, delegation of authority will also help to develop human resources, while the present arrangement is not at all helping this. As a matter of fact, under the present system, better managers have no incentive to put in their best, while the lesser ones are getting away under the escape clause of corporations' responsibility. Decentralization will induce the better managers to make determined efforts to prove their worth, while less competent ones will find themselves in a situation where it will be necessary for them to work hard and improve for survival. there are certain cases where delegation is not possible, corporations may be charged with the responsibility of running these enterprises for decentralization as soon as the situation would permit.

Thus, under our proposal, enterprises are to enjoy full operational freedom as the commercial units, while corporations are responsible for coordinative and supervisory work. The Minister-in-Charge, who is accountable to the Parliament and, through it, to the people, should be responsible for broad policy making. Indeed responsibilities of the Minister-in-Charge, corporations and enterprises have to be defined clearly and in details. Without this, the principle of accountability cannot be implemented. Detailed rules of business shoud be worked out as quickly as possible, keeping in view the socio-political objectives of the state and the nature and characteristics of different industries concerned.

To summarise, the essence of our approach to the institutional structure of nationalised industries, then, consists in (a) full realization by the government that production in the nationalised sector is a fundamental government responsibility with appropriate steps taken to have all government departments understand this clearly and act accordingly in their relationship with the sector ; (b) evolution of institutional structure, policy framework and rules of business with due emphasis on the essential features of productive activities, flexibility and quickness, with clear demarcation of responsibilities between different tiers of control ; and (c) decentralization of authority to productive units.

IV. CRITERIA FOR PERFORMANCE EVALUATION

There does not appear to be a clear official position on the criterion for performance evaluation except that capacity utilisation has been used in the First Five Year Plan as the measure of efficiency of performance in the nationalised industries. While, the immediate post-liberation task was to rehabilitate production, there can be no dispute that the nationalised industries must be made efficient in terms of productivity if the industrialization programme of the country is to be placed on a sound foundation and that allocation of resources must be made on the basis of social profitability if most efficient allocation of resources is to be ensured.

From the national point of view, social profitability (i.e., the profitability based on true scarcity values of all inputs and outputs, with transfer payments ignored) is the most relevant criterion since it measures the contribution of an investment to the society's total benefit. The government should, therefore, be primarily interested in social profitability of investments and its maximization should be the most desirable objective.

If market prices reflected true scarcity values. then the private profitability (i.e., the profitability based on market or actual prices inclusive of transfer payments) and the social profitability would be the same, but for the transfer payments. However, due to market imperfections of various kinds, observed prices differ from true scarcity values and, hence, private profitability and social profitability may diverge widely on this account. For example, in pre-liberation Bangladesh, because of a distorted price structure, private profitability of large-scale manufacturing industries was extremely high even though these industries, by and large, were highly inefficient and, as a consequence, their social profitability was small, even negative [5; p. 152]. In these circumstances, social profitability should be estimated by using shadow or accounting prices (in place of actual prices). Obviously, successful application of this test depends on the availability of a good set of shadow prices. However, the Bangladesh Planning Commission has provided guidelines for the computation of shadow prices in respect of many inputs and outputs and have undertaken to provide shadow prices for the rest for project preparation purposes. These can be used for performance evaluation purposes as well.

Now, the ideal objective should be the maximization of social profitability. This will be achieved in each case by producing at the point of equality of marginal cost and marginal benefit, all inputs and outputs being valued at their shadow prices. In practice, it is not so easy to define that output due to lack of complete knowledge about the level and shape of cost and revenue curves and uncertainties. Therefore, the performance of the nationalised industries should be judged by their ability to maintain a minimum (however defined) level of social profitability and improve upon it. Decisions regarding the expansion of capacity in any industry should also be based on social cost benefit calculations. Large-scale industries in Bangladesh, as mentioned before, were highly inefficient in pre-liberation days and today their social profitability is likely to be very low, may be even negative. This trend can only be reversed by improving the productivity of the nationalised industries. Hence, in addition to social profitability test, productivity tests should also be applied to evaluate the performance of the nationalised industries in Bangladesh.

In measuring productivity, one should compute both total and partial productivity ratios—the former measuring overall productive efficiency i.e., real cost per unit of output and the latter, measuring the efficiency with which particular resources are being utilized. The term 'productivity' is generally used to denote the ratio of output to associated inputs, taken singly or some or all together, in a given time period, in real terms. Partial productivities are defined as ratios of output to particular inputs, and total productivity is defined as the ratio of output to all the associated inputs combined in a suitable manner. One can apply these tests to identify the overall and specific inefficiencies so that corrective measures can be taken to remove them. For a methodology for productivity measurement, one may refer to Ahmad and Choudhury [2].

The responsibility, to ensure that these criteria are properly applied may be given to a specially created organization like the proposed special Prices and Tariff Commission, to which all the relevant information must be submitted by the nationalised industries regularly.

V. THE PRICING POLICY

Public sector units produce a wide variety of products and, currently, a number of authorities are involved in price fixing. In certain cases, the Cabinet fixes prices (e.g., fertilizer, newsprint, sugar etc.) ; in certain cases, the Ministry of Commerce fixes prices (e.g., motor cycle, bicycle, ceiling fan, bus chassis, cement etc.) ; and in certain other cases, corporations fix prices on their own (e. g., most pharmaceutical and rubber products, most machine tools and spares, matches etc.). There is no rational basis for price fixing and, hence, an anomalous situation prevails. It is necessary to remove the anomalies and rationalise the price fixing process. To be rational and purposeful, the pricing policy must be evolved on the basis of a clearly defined objective or objectives to be achieved through it.

In imperfect market conditions, the pricing policy is a poor guide to output decisions and, hence, output decisions should be based on social profitability, which is independent of market prices. The pricing policy may not, therefore, be used for output determination purposes. The main considerations in the pricing policy should be the need for financial surplus, for government exchequer as well as for industries, and consumer welfare. The government may want to use the pricing policy to generate cash surplus in the nationalised sector transferable to the state exchequer for use in the public interest. The financial viability of industries is extremely important for operational flexibility without which productivity may suffer. If such prices are imposed on industries as may mean losses or not enough cash surplus for flexibility and smoothness of operation, then direct and indirect subsidies and easy bank loans will have to be provided to them just to keep the wheels of factories rolling. This is neither efficient nor sensible from adiministrative point of view as well as from the point of view of operational freedom of the industries as funds may not be forthcoming as needed. It is, therefore, highly desirable that nationalised industries should be allowed to generate cash surplus.

The question that now arises is whether the industries should be left completely free to fix their prices so that they may be guided by cost, demand and profit maximization considerations. Here, the question of consumer welfare becomes pertinent. Clearly this relates to goods sold to domestic consumers as export industries should be completely free to maximize profits on the basis of best prices they can obtain, given appropriate exchange rate, subject to restrictions that may be imposed for strategic or promotional reasons. Turning to goods sold to domestic consumers, for social and incentive reasons, it may be desirable to subsidize the consumers of a certain commodity or certain categories of its consumers. What should be the pricing policy in this case ? It is rightly argued [6 ; p. 262] that such subsidization should rather be done through budgetary means than by imposing price restrictions on industries since the former is more efficient as it does not prevent industries from generating needed cash and also permits easy estimation of the subsidy paid. Moreover, in the absence of a suitable distributional system, regulated prices cannot be implementd to benefit those who are intended to be the beneficiaries. A priviledged group of distributors or dealers will make huge profits, while the ordinary consumer will pay high prices. This is precisely the experience in post-liberation Bangladesh with regulated prices. Again there is the argument that since, under nationalisation, enterprises may be in a position to exercise monopoly powers, complete freedom to fix prices on their part will involve high profits at the cost of consumers. The exercise of monopoly power means restriction of output for charging high prices. But in our nationalised industries, output has been a function of physical availability of inputs, imported and local, and ability of management, while monopoly element has had little to do in this respect.

A further argument against price regulation in the public industries is available in those cases where a substantial private production, with complete pricing freedom according to market signals, competes with the public sector as this will put the public sector at a comparative disadvantage.

From the above discussion, it emerges that there is no case for price control in our nationalised industries. Indeed, because of an ineffective distributional system, price control has so far benefited a group of middleman at the cost of consumers. Prices should, therefore, be fixed on the rational criterion of balancing demand and supply without the need for rationing. Of course, the prices charged along with costing must be regularly submitted to the Prices and Tariff Commission. The surplus will accrue to the state, which the state can use in the public interest. Appropriate auditing and other financial checks must, of course, be ensured in public enterprises.

When production is regulated by social profitability considerations, the role of the market price is to match market demand with that supply. The right price may not be reached at the first instance. It will be reached through iterative changes of the price by watching the inventory level at the enterprises as balancing of demand and supply implies carrying of appropriate inventory level at the enterprises. Too fast a depletion of the inventory implies too low a price and too slow an off-take implies the opposite, calling for price changes in the appropriate direction for iterative approach towards the right price. Now, the proposed special Prices and Tariff Commission can play a role in this process by monitoring relevant information so that the iteration process can be reduced to a minimum by correct diagnosis and quick corrective action.

Let us now turn to the current proposal for rationalising the pricing policy for nationalised industries products. The basic guideline that has been recommended by the Planning Commission [6; p. 262] is that all corporations and nationalised enterprises, with the possible exception of export industries, will be free to fix their prices up to a limit of 10% of their cost of production. Prices with larger mark-ups can be fixed only with clearance from the Prices and Tariff commission. As a principle, to base price exclusively on cost is unsound as demand and, hence, supply-demand balance, is ignored in price determination. Currently, on the proposed mark-up, or even on 15% mark-up as being claimed by corporations, prices of most commodities, particularly of consumer goods will be much lower than market equilibrium levels. To obtain clearance from the Prices and Tariff Commission for fixing prices on larger than freely available mark-up would be a time consuming, and perhaps costly process. Existing situation seems to demand a pricing system on the basis of demand-supply balance without the need for rationing. A control price, whether based on percentage mark-up on cost or determined otherwise on consumer welfare consideration, cannot be implemented because of very weak and highly ineffective distribution system.

Moreover, the question of definition of costs on which to put the mark-ups may not be easy to resolve. In order to have a meaningful cost base for pricing, efficiency and capacity utilization levels for the cost base have to be appropriately specified, which may not be an easy proposition in practice. Changes in costs over time will make the system even more difficult to handle. The question of reliability of data also becomes pertinent here as there may be a tendency to overstate costs under this pricing system. These problems could, however, be overcome by working out, for pricing purposes, standard costs of production for products at a given time to be adjusted as conditions change. But, the procedure will make a heavy demand on scarce skill and expertise and will involve a heavy work load and huge costs and, in fact, a tremendous amount of work will also be required even before it can be introduced by way of educating the people concerned in industries and ministries about the method, as they are not familiar with it, of collecting basic data and preparing the original set of standard costs.

It should be noted that, if productivity and social profitability tests are not properly enforced, the cost+percentage mark-up pricing system can, in fact, encourage inefficiency. First, since larger output means larger profit and cost reduction implies lower profit per unit, output expansion may be pursued without proper emphasis on cost reduction and efficiency improvement aspects. Secondly, profit being a percentage of cost of production there is a premium on inefficiency as higher costs imply larger profits ; and, in a scarcity situation, where a large output can be sold at a higher price, this can lead to gross inefficiencies as larger profits are earned.

V. CONCLUDING REMARKS

We have dealt with three major aspects of the management of nationalised industries in Bangladesh. It is extremely important to sort out these aspects appropriately in order that the sector can be organised for efficient management. There are various other problems currently facing the sector, some of which are perhaps of greater immediate concern as they may be seriously limiting production and productivity. These problems include shortage of managerial and technical personnel and skilled workers [1], poor motivation and incentive structures [1], absence of a labour policy, lack of proper planning at both industry and enterprise levels, financial adequacy, inflexibility and indiscipline, shortage of imported raw materials and spares, power failure and law and order situation. The last four have tended to be major reasons for production losses since liberation [3]. However, regarding most of these problems, solutions are well known and what is necessary is action.

Finally, it is to be noted that a serious policy vacuum exists in the whole nationalisation programme. The purpose of nationalisation has not been clearly defined by the government. It is just abolition of private property in selected large-scale industries, or a step in the direction of socialist transformation of the economy? The recent raising of private investment ceiling from Tk. 2.5 million to Tk. 30 million makes it even more important that the political purpose of nationalisation is clearly and firmly defined so that policy planning can be based on a sure political ground. Policy planning is ultimately determined by the political context within which it takes place.

REFERENCES

1. Ahmad, Q. K., "The Management of the Nationalised Industries Sector of Bangladesh : Some Comments on the First Five Year Plan Proposals", Paper presented at Bangladesh Economic Association Conference on the First Five Year Plan of Bangladesh held in Dacca, March 17—20, 1974 and forthcoming in the Conference Volume of the Journal of the Association.

2. Ahmad, Q. K. and Anwaruzzaman, Chowdhury, "Productivity Trends in the Manufacturing Sector of Bangladesh : A Case Study of Selected Industries", *The Bangladesh Economic Review*, Vol. I, No. 1, April 1973.

3. Ahmed, Tajuddin, *Budget Speech*, 1974/75, The Ministry of Finance, Government of The People's Republic of Bangladesh, June 19, 1974.

4. Alamgir, M. and L. J. J. B. Berlage, *Bangladesh : National Income and Expenditure* 1949/50—1969/70, BIDS Research Monograph No. 1, June 1974.

5. Khan, A. R., *The Economy of Bangladesh*, Macmillan, 1972.

6. Planning Commission, Government of The People's Republic of Bangladesh, *The First Five Year Plan*, 1973-78, November, 1973.

7. Sobhan, Rehman, "Nationalisation of Industries in Bangladesh : Background and Problems" (Mimeo).

Nationalised Industries of Bangladesh : Problems and Prospects

by

MOHIUDDIN ALAMGIR*

I. INTRODUCTION

A review of the problems faced by the nationalised industries of Bangladesh during the last two years would indicate clearly that a lack of appreciation of the basic issues related to nationalisation has led to a rather anomalous situation in the major production enterprises of the country. These issues are of three types; (i) technical, (ii) institutional and (iii) ideological.

Technical issues involve : (a) understanding of the implication of nationalisation for economic planning, with its national, regional and sectoral dimensions ; (b) determination of performance criterion of the nationalised industries ; (c) fixation of prices for the products of public sector enterprises and (d) formulation of policies related to accumulation.

Institutional issues are two-fold : (a) evolving a satisfactory organizational framework for the management of nationalised enterprises and (b) defining the interrelationship between labour and management and outlining the code of conduct for them separately.

Finally, ideological issues are concerned with the (a) role of incentive and (b) method of developing social agents of production.

The above fits in quite well within the constitutional objective of establishing a socialist order in Bangladesh. The First Five Year Plan of Bangladesh correctly states the following :

---

*The author is a Senior Research Economist at the Bangladesh Institute of Development Studies, Dacca.

> "The removal of the capitalist system of income distribution, of the private ownership of means of production and of the precapitalist mercantile or feudal forms of production relations is a necessary precondition for socialist development". [13; p. 2].

Since, its inception, the programme of nationalisation in Bangladesh has been plagued by many problems. The absence of autonomy at the corporation[1] and enterprise level and also the involvement of a large number of agencies in the decision making process has been mentioned by many as seriously limiting the operational efficiency of the public sector enterprises, mainly the nationalised industries in post-liberation Bangladesh. These issues have also come up frequently in the socialist countries during the course of debate over centralised and decentralised planning. Most of these countries have gone through successive phases of bureaucratic centralisation and decentralisation of the decision making process with regard to the management of nationalised enterprises. The recent trend is towards a more flexible approach in terms of accommodating both centralised and decentralised planning. Centralised planning provides a general guideline for the whole economy, while decentralised planning is used at the enterprise level in determining level of production, marketing of output, purchase of inputs and so on [9; 10; 14; 15; 24; 32; 33; 34]. A similar model should work quite well in Bangladesh. It appears that the question of autonomy and multiplicity of authorities in the decision making process can be relegated to the background, once a smooth coordination among various governmental agencies is ensured. For this, clear channels of horizontal and vertical flow of information must be established.

Serious problems arise in many cases because strategic inputs into the production and distribution processes are beyond the control of the corporations and enterprises. Therefore, production and distribution process are interfered with due to a bottleneck in the supply of, (i) raw materials, (ii) transport facilities, (iii) internal finance (liquidity) and (iv) foreign exchange. Clearly, some of these are interdependent, though they all depend in turn on the overall state of the

---

[1] For the composition of the various corporations see Qazi Kholiquzzaman Ahmad's article in this issue of the journal. The relationship between corporation and enterprises is also dealt with extensively by him.

economy. The situation in Bangladesh is not likely to improve unless, among other things, the following happens.

(a) The resource (financial and physical) base of the country is expanded--implying substantial increase in accumulation, particularly in the nationalised sectors and also a determined drive is made to increase the availability of foreign exchange. Major export industries being nationalised, the relevant corporations and enterprises with the help of other appropriate government agencies, must undertake adequate steps to capture foreign markets and also to reduce costs of production, so that the need for export subsidization is eliminated or at least minimised.

(b) Corporations and enterprises should be allowed to obtain their required imports directly without any intermediary. Clearance at the landing points should take place on a priority basis.

(c) In the case of domestic raw materials, appropriate steps should be taken to maintain a smooth supply line. This will involve, (i) strengthening of the law enforcing agencies—law and order problems have seriously affected the raw material supply position of the Bangladesh Paper and Board Corporation, (ii) adoption of appropriate financial and administrative measures—e.g., raising the price of sugarcane to the grower and taking measures to stop smuggling of molasses (*gur*).

(d) A strict financial discipline should be enforced upon the corporations and the enterprises under them. While there has been a continuous clamour on the part of the corporation and enterprise management for liberal allocation of domestic finance to which the government responded with easy bank credit, the fact remains that not all of the enteprises can claim productive utilisation of funds. On the contrary, this has added to the inflationary pressure in the economy. During 1972, the nationalised industries alone were responsible for an increase in the money supply to the tune of Tk. 130 crores [9 ; p. 260]. Easy credit seems to have made enterprise management less cost conscious and it is no wonder that within a short time after liberation, cost of production shot up manyfold in most of the public sector enterprises. For example, in jute manufacturing, on an average, the cost of sales soared from Tk. 2172 per ton during 1969/70 to Tk. 3804 during July-December, 1972 [1 ; p. 13].

The political authorities are said to be contributing to the unsatisfactory performance of the nationalised industries in three ways. (i) There is some amount of indifference on the part of the political leadership in matters of management of the nationalised industries. This is clearly indicated by the fact that many of the corrective measures to improve the efficiency of the nationalised industries are yet to be adopted. (ii) There is considerable scope for conflict between political and administrative decision making and the political authority has done nothing to remove this. (iii) Interferences from political and trade union leaders are too frequent for the healthy operation of any productive enterprise. Obviously, there are no easy solutions to these problems, these are to be solved through the socio-political dialectic process. For the moment, one can only hope that, (i) the political leadership in Bangladesh will make a more serious commitment towards establishing a socialist order and (ii) the dichotomy between political and technical administration will be removed.

On the labour front, the problems faced by the nationalised industries were perhaps more serious than any one of those mentioned above. The primary manifestations were, (i) surplus labour in production units,[1] (ii) lack of skilled labour, (iii) lack of efficient management cadre and above all (iv) unhelpful trade union activities.

II. IMPLICATION FOR PLANNING

Nationalised industries provide an excellent opportunity for the formulation of a comprehensive industrial development plan in Bangladesh. In general, planning in Bangladesh has so far suffered from certain short-comings which arise due to, (i) the poor quality of statistical information, (ii) the lack of indepth study on various aspects of the economy, (iii) the absence of appropriate social and economic institutions and (iv) the absence of a long term perspective plan for the socio-economic development of the country [6 ; p. 1]. However, not all of the above are equally important for nationalised industries.

---

[1] The Textile Corporation is reportedly carrying substantial number of extra labourers. In the jute manufacturing labour load per worked loom increased from 2.76 in 1969/70 to 3.19 in 1972[1; p. 19].

The quality of data while quite poor elsewhere in the economy is not so for the public sector enterprises. Planners have direct access to all types of information so that in formulating a development plan at the national level, it becomes easy to take into account the requirements of the nationalised industries, and to specify a set of consistent targets for corporations and enterprises. In Bangladesh, there being a history of public sector industrial enterprises, relevant indepth study for industrial planning should not have been a very difficult task. The First Five Year Plan of Bangladesh was formulated on the basis of an input-output model. As is required by such a model, the decision regarding the choice of sectors for domestic expansion vis-a-vis import was made exogenously on the basis of available studies on comparative advantage of Bangladesh in the production of different commodities. Unfortunately, most of these studies were outdated and in the context of changing relative prices of input and output and also loss in productive efficiency in many cases, it appears that there was and there still is a great need for carrying out indepth studies on the comparative cost situation for various tradeable items (most of which are produced by nationalised industries) before any decision can be taken regarding their expansion. This is absolutely essential, on the one hand, to determine allocation of resources between the industrial sector and other sectors of the economy, and to determine allocation of resources within the industrial sector among different industries.

In the above context, one must ensure efficient utilisation of resources by the nationalised industries. For this there should be proper production and financial planning at the national and enterprise level, the enterprise plans being coordinated through the corporations. Although, at the enterprise level, the plans are to be drawn up independently by the management, they must have some correspondence with the national plans. Besides, revision of the targets set at the national level should be based on a proper assessment of the plans drawn at the micro-plant level. Such a process of iteration will help anticipate many of the problems identified above and adopt suitable corrective measures.

From the available indications, it appears that while there has not been any significant capacity expansion in any one of the nationalised industries of Bangladesh, in a number of enterprises a substantial amount of unutilized capacity remains.[1] In the absence of comprehensive production and financial planning,

---

[1] For some data see Qazi Kholiquzzaman Ahmad's paper in this issue of the journal.

nationalised industries are being operated on a rather adhoc basis with a relatively narrow and short term outlook. What is really necessary here is a bold approach, formulation of a perspective plan with sectoral and regional components integrated into it. In a country like Bangladesh, regional planning is particularly relevant for formulating industrial development strategy. While different regions of the country have peculiar needs and characteristics, a balance can be struck in the relative rates of growth by a proper distribution of the industrial development. The task becomes easier when the nationalised sector dominates the scene.

The First Five Year Plan seems to have ignored the above points. The question of incorporating regional dimension in planning has been touched upon only briefly in the chapter on industry where the policy measures suggested for the geographic dispersal of industries are stated in very general and vague term. Furthermore, these policy measures have not been formulated on the basis of a consistent set of criteria which should have guided the overall sectoral and regional allocation of resources.

III. PERFORMANCE CRITERION, PRICING POLICY AND GENERATION OF SURPLUS

On problems and policies for the nationalised sector, the First Five Year Plan of Bangladesh writes the following :

> "Clearly defined objectives must be set for each sector. Production targets, efficiency levels, cash surplus generation and other defined objectives should be spelt out for the corporations and by the corporations for the enterprises. Even within enterprises, objectives are needed to be set up for sections and even individual workers. Absence of precise targets makes it difficult to evaluate performance, motivate workers and identify and correct lapses" [13 ; p. 251].

The above indicates the Planning Commission's appreciation of the need for a performance criterion of the nationalised industries, but does not clearly reflect its thinking on the subject. Ahmad [3 ; p. 13] has pointed out that the Planning Commission has, by and large, been concerned with only utilization of capacity. In a situation marked by acute scarcity of commodities concern over capacity utilization may have some relevance, but this cannot remain as the sole criterion over the long run. What really has to be understood, is that criteria or indicators of enterprise performance must be evolved within the framework of national objective (s). In other words, the exogenously determined objective(s) (indicator (s)) of individual enterprises should be clearly linked with national objective(s).

In the socialist countries a large number of indicators of enterprises performance were tried at various times. Years of debate in these countries [10; 11; 16; 19; 21; 31; 32; 33] has revealed that there cannot be any doctrinaire solution to this issue except that the ultimate decision must have relevance for the realisation of the socialist objectives. In most of the countries one can identify two phases, the early phase and the 'reformist' phase. During the early phase,[1] more important among the various indicators used were, the volume of output, the value of output produced, the value of output realised, the value of production (value added), the volume or value of trade turnover, certain indices such as, index of the turnover of circulating assets and index of the above-plan cost reduction.[2] None of the indicators were found to be totally satisfactory and in most cases more than one indicator was used. Problems were faced because, in general, efficiency consideration was neglected by the enterprise management and workers and also because of "conflicting effects of different indicators, so that attainment in one direction was often offset by detriment in other respects" [33 ; p. 9].

Problems with the early phase indicators lead socialist planners to think about alternatives. As a consequence, the debate over the use of 'profit' as a criterion for evaluating enterprise performance was revived.[3] Along with other economic reforms the criterion was first accepted in Yugoslavia in 1952 followed by Hungary

---

[1] This phase continued in the USSR and other socialist countries of Europe except Albania until different parts of the 1960's. In Yugoslavia reforms were introduced as early as 1951.

[2] For a discussion of these indicators see [33; pp. 3—9].

[3] There were some discussions on it in the USSR in the early 1920's. The issue, however, was not pursued further after 1928 and there was no serious discussion on it even among academicians until 1948 when Evsei G. Liberman explained his ideas at a meeting of economists in Moscow [33; p. 11]. He later made his views public in an article in *Pravda* in 1962.

in 1957, USSR in 1965 and other European socialist countries (except Albania) in the late 1960's. In China until 1957 enterprises were officially assigned twelve targets and following 1957 these were reduced to four of which 'profit' was one [11 ; p. 159].[1] Albania seems to be continuing with early phase indicators. However, there is one element, payments to the budget, which presumably comes out of profit (surplus) of the enterprise [34 ; p. 21].

The greatest advantage of the 'profit' indicator over other types of indicator is its 'synthetic' nature. It takes account of both the input and output sides and comprehensively reflects the efficiency of all the different operations combined together. Furthermore, it is claimed that profit is the most important source of accumulation in the economy that effects growth rate as well as distribution of national income [21 ; p. 23].

Alternative variants of the 'profit' criterion are available : the profit mass, the rentability rate, the profit rate and gross income [33 ; Chapter 2]. The profit mass is calculated as the excess of total income of the enterprise (sales+other income including subsidies) over all expenditures (prime cost+payments to state budget+capital charges+other expenditures). The rentability rate and the profit rate are the percentage ratios of profit to the prime cost and the value of enterprise assets (fixed + circulating) respectively. In more common usage, the latter is known as the rate of return on gross capital employed. Gross income is nothing but the sum of total wage bill and profit.

Each variant of the 'profit' criterion is not without any shortcoming which makes reliance on any one exclusively, if not carefully administered, rather hazardous. Moreover, while in planning under socialism, calculation of indicators presents no problem, in a mixed economy serious problem arises due to divergence between social and private profitability. For 'profit' criterion to be maningful in such economies, one must find satisfactory answer to this problem.

---

[1] During the great socialist cultural revolution of 1966/67, 'profit' was under attack ;".. this must not, however, be taken to mean that thereforeward the concept of the rate of profit on capital was ignored in practical decisions. The chief argument used against those ideas is ideological—that they would involve the collapse of socialism, for the use of profit on capital as the major success indicator, is considered intrinsically capitalist" [11; p. 163].

Bangladesh is a case in point. The basic national objective as given in the First Five Year Plan, is to reduce poverty. Growth of output and income, equitable distribution of income and a high rate of accumulation are necessary preconditions or instruments to attain the above objective. Accumulation is extremely important because a high rate of growth of output and income cannot be sustained without a high rate of accumulation. A part of the accumulation fund can be, and in many cases is used as the distribution fund. If the normal production process creates any inequity in the economy, the distribution fund can be utilised to correct it. Besides, the distribution fund can be used as an incentive fund so as to get the best out of the enterprise management and workers. Profit sharing is quite common in many socialist enterprises. In this context, profitability becomes a very relevant criterion for evaluating the performance of the nationalised enterprises in Bangladesh. However, as Ahmad [3 ; p. 20] points out, the relevant concept is social profitability. He does not elaborate his concept of 'profit' criterion any further. From his discussion it is not clear which of the above four concepts of profitability should be used in Bangladesh.

It is contended here that for judging the performance of the nationalised enterprises in Bangladesh all four variants of the 'profit' criterian should be calculated.[1] One should not, however, minimize the problem of valuation of outputs, costing of inputs and also the valuation of enterprise assets wherever applicable. Here the pricing policy emerges as the most important link between the enterprise operation and the realisation of enterprise and national objective(s).

Pricing can be used to realise three objectives, (i) generation of surplus, (ii) distribution of income and (iii) efficient allocation of resources at both micro-plant and macro-economic level. Ahmad's concern in using market determined prices in Bangladesh, for calculating the profitability of nationalised enterprises, is quite justified. He recommends the use of shadow or accounting prices for calculating enterprise profitability and at the same time recognises the need for a different set of actual prices (i.e., prices at which real transaction takes place in the market). In terms of the objectives of pricing policy mentioned above, actual prices should be designed as instruments for generating surplus and dis-

---

[1] In certain cases enterprises may be subjected to some side conditions, e. g., it may be desirable to impose a constraint on the product mix of the enterprise.

tributing income. On the other hand, shadow prices should be used to effect efficient allocation of resources. However, in view of the recent economic reforms in socialist countries [14; 16; 22; 23; 24; 26; 28; 32; 33] it may be suggested that in Bangladesh, planners should take measures to reduce the difference between the actual and shadow prices. Therefore, the following may be stated as general principles on which the pricing policy of the nationalised enterprises in Bangladesh should be based [32; p. 78]: (i) prices must reflect the contribution of all resources in addition to labour; (ii) a closer correspondence between retail and producer's prices has to be ensured; (iii) prices should reflect market supply and demand conditions and (iv) prices of tradeable goods should have close links with international prices.

One can, however, go beyond what is said above and suggest a guideline for immediate use in Bangladesh to determine the basis of valuation of inputs and output so as to evaluate the performance of the nationalised enterprises.

In this context it is suggested that all final output and intermediate products be evaluated in terms of international prices. The international price of any commodity will reflect the opportunity cost of producing at home instead of importing. It is assumed that international prices are insensitive to quantities bought and sold. There are two problems associated with this procedure. (1) At what rate should the international price be converted into domestic price? This points to the problem of determining the shadow price of foreign exchange which will be discussed later. (2) International price may differ from one source to the other. In such a case, a weighted average of the different prices should be taken. The weights should be the proportions of supply in the international market that originate from different sources.

Some remarks should be made now on the pricing of primary inputs, e. g., capital, labour and foreign exchange, in the performance evaluation of enterprises. A large volume of literature is available on this topic. What will be said below will draw heavily form these writings. It is emphasised over and again in the literature on planning that primary input prices should be such as to reflect their true scarcity. The best way to derive these prices for a country like Bangladesh would be to use a trial and error method in the sense that a price should be initially decided upon by the Central Planning Authoirty on the basis of past experience and if this price leads to surplus or deficit of the amount of resource consumed then the price may be revised accordingly. Some suggested initial prices are as follows. (1) For capital, a weighted average of the various existing interest rates can be taken as a first approximation. The weights should be the proportion of total volume of credit coming from any source in the base year. (2) For labour, the price should be different for different types of skill. For example, in the case of unemployed unskilled labour the price should be equal to the cost of minimum consumption bundle plus a transfer cost if he is moved from one region to another. It should be noted that the shadow price of the unemployed unskilled labour is not taken to be zero as is sometimes assumed. The reason is simply that given the present level of development in Bangladesh, and given capital and other resources, the amount of employment of the above types of labour in any particular project could never be pushed to an extent so as to make marginal productivity of labour zero. For different types of skilled labour differential income will have to be maintained in order to reflect the differences in productivity. The existing wage differential may not be a good indicator since it reflects different bargaining power of the different groups of labour as well as impact of the existing institutions which will undergo changes in the process of socialisation. A correction will be necessary to take account of these factors. (3) Finally for foreign exchange the first approximation to the shadow price would be the official exchange rate inflated by a weighted average of the rates of tariff and subsidy on various types of imports and exports respectively. The weights are the value of imports and exports of different commodities as a proportion of the total. This implies that with any change in the rate of tariff or export subsidy the initial shadow price of foreign exchange used for performance evaluation changes.

The pricing policy of public sector enterprises is related to generation of surplus. A large part of the profit earned by the nationalised enterprises goes into the accumulation fund. Therefore, investible surplus comes out of the profit of enterprises. However, in Bangladesh, due to the relatively small size of the industrial sector, its contribution to the accumulation fund has remained low. For example, in 1968 69 the corporate industrial sector (approximately 85% of which is now nationalised) generated a surplus of about Tk. 229 million [7; Tables B.2 and B.3].On the other hand, saving (defined as retained earnings +depreciation) by this sector in 1969/70 amounted to Tk. 183 million which was only 6.2% of the total domestic saving of Bangladesh [7; p. 27]. During the 1960's, on an average, the rate of return (gross profit as a % of gross capital employed) from this sector was 12%. The jute industry with 16% registered the highest rate of return while the sugar industry with 3% rate of return was the least profitable sector [7; p. 152]. The situation in the post-liberation Bangladesh is quite alarming as the estimated rate of return in 1973/74 from the nationalised industries is only 3.0%.[1] Clearly, there is need for a resturcturing of the operation of the nationalised enterprises so that the society receives a substantial contribution into the accumulation fund from these enterprises.

IV. ORGANIZATION AND LABOUR-MANAGEMENT RELATIONSHIP

At various stages under both socialist planning and mixed planning different variants of organization of nationalised enterprises have been experimented with. The basic questions involved are the following. (i) What should be the management structure of the enterprises? (ii) What should be the hierarchy of controls? (iii) How should public accountability be ensured?

Three different forms of organization have been in use to manage nationalised enterprises. These are, (i) on the same basis as other state activities,(ii) state corporations and (iii) joint-ownership corporations. The third type was tried in a number of socialist countries during the initial period after revolution and they were later turned into state enterprises. In China by 1960, all state—private concerns became state enterprises [11; p. 147]. Many of the developing countries practising mixed economic system, initially did not make any distinction 'between public enterprises and traditional governemtnt functions' [29; p. 5]. This system, while ensuring direct political and administrative control by the responsible authorities, suffered from certain rigidities because of implicit budgetary and other controls which were by no means conducive to progressive management of state owned industrial enterprises. This gave rise to the emergence of public corpora-

---

[1] This figure is based on the profit data from [12; p. 8] and an estimated value of enterprise assets (fixed assets at replacement cost) of Tk. 900 crores obtained from [13; p. 39]. The Planning Commission estimate was 5% but it included interest payment and repayment of loan [13; p. 39].

tions, 'which could be clothed with the power of government, but which would posses the operating flexibility of private enterprise' [29; p. 9]. In socialist countries, the general structure is that the state owned enterprises are controlled through various ministries[1] and regional economic councils although the degree of centralised control over the operation of individual enterprises has been significantly reduced over time.

The system of organization adopted in Bangladesh appear to be a combination of the practices followed in non-socialist planned economies and socialist planned economies. Ahmad observes that the present system is unnecessarily hierarchial which breeds inefficiency and creates 'a lengthy process involving costly delays and bottlenecks' [3; p. 24]. He goes on to suggest an alternative framework in great details. What is really missing is the link between the organizational framework proposed and the realisation of the objective of socialist nationalisation. To establish this link a few things must be clearly understood. (i) All nationalised enterprises are properties of the state and in turn belong to the people. Workers' claim to the ownership of the assets of state enterprises is limited to their weight in total population. Lack of appreciation of this point has given rise to unfair demands from the workers in nationalised enterprises in Bangladesh. (ii) Workers, enterprise management and all other relevant authorities should be directly or indirectly accountable to the people for their action related to the operation of the state enterprises. In Bangladesh this exists in theory but hardly practised in reality. (iii) There must exist a cordial relationship between workers and management in state enterprises. They should be able to work as a team and not as adversaries as it is happening today in Bangladesh. In this respect, the political authority has a very important role to play in educating the workers as well as the management in the art of peaceful coexistence and productive collaboration.

In order to facilitate the above, two changes are proposed over and above Ahmad's proposals. These are, (i) separate ministries should be formed for each type of industrial activity and (ii) enterprise management should be entrusted with persons who are not only technically competent but also politically and ideologically motivated.

---

[1] In China, for example, three ministries supervise consumer goods production while heavy industry is controlled and supervised by twelve ministries [10; p. 149].

V. ROLE OF INCENTIVES AND DEVELOPMENT OF SOCIAL AGENTS OF PRODUCTION

In order to realise the socialist objectives in Bangladesh, the labour resources which is the most important productive agent must be efficiently utilized. This requires on the one hand,that the productivity of the currently employed labourers is raised, and on the other hand, that the reserve army of unemployed labourers is drawn into productive employment. Clearly, the nationalised enterprises have a very important role to play with respect to the first requirement while due to its small size in relation to the economy as a whole, the state sector for some time to come is unlikely to be an important source of productive employment in Bangladesh.

Labour productivity can be raised substantially if a proper incentive structure is developed. Most of the socialist countries have accepted the role of incentives in raising labour productivity and also improving upon the overall enterprise performance. In this respect, the importance of material incentive is recognised although the role of moral incentives has by no means been relegated to the background. In Bangladesh too, there is need for developing a systematic structure of incentives for workers and management of the nationalised industries. Following the recent practices of socialist countries, the material incentives should be related to the enterprise performance measured by any 'synthetic' indicator as discussed earlier. However, initially because of the high opportunity cost, the amount that can be withheld for the incentive fund should be a relatively small proportion of the total accumulation fund. This amount can be raised with each stage of development.

Given the level of poverty prevailing in the country and the limited resources available, material incentives can only play a minor role in Bangladesh. It seems there is some logic in making efforts to make workers respond to moral incentives. Each worker must be so trained as to act not only as an economic agent of production (sensitive to material incentives alone), but also to act as a social agent of production (responding effectively to moral incentives also). In this respect, the model of having primary party organizations (consisting of political cadres) within the industrial enterprises may be worth looking into. However, in order to avoid the internal conflict it is recommended that in Bangladesh the political, technical and administrative cadres should all be ideologically and politically motivated.

REFERENCES

1. Ahmad, Q. K, "An Analysis of the Profitability of the Jute Manufacturing Industry of Bangladesh in the Post-liberation Period", Research Report (New Series) No. 10, Bangladesh Institute of Development Studies, Dacca, June 1973.

2. ——————, "The Management of the Nationalised Industries Sector of Bangladesh: Some Comments on the First Five Year Plan Proposals", A paper presented at the Bangladesh Economic Association Conference on the First Five Year Plan of Bangladesh, Dacca, March 17-20, 1974.

3. ——————, "Salient Issues in the Management of the Nationalised Industries Sector of Bangladesh", A paper presented at the joint BIDS BEA Workshop on the Problems and Prospects of the Nationalised Industries of Bangladesh, Dacca, May 25, 1974.

4. Alamgir, M., "Priorities for Development and Allocation of Resources", A paper presented at the International Economic Association Conference on the Economic Development of Bangladesh within the Framework of a Socialist Economy, Dacca, January 1973.

5. ——————, "Resources for Development", A paper presented at the International Economic Association Conference on the Economic Development of Bangladesh within the Framework of a Socialist Economy, Dacca, January 1973.

6. ——————, "Some Reflections on the Objectives, Strategies and Priorities of the First Five Year Plan of Bangladesh", A paper presented at the Bangladesh Economic Association Conference on the First Five Year Plan of Bangladesh, Dacca, March 17-20, 1974.

7. ——— ——and Rahman, A., *Saving in Bangladesh* 1959/60—1969/70, Research Monograph No. 2, Bangladesh Institute of Development Studies, Dacca, June 1974.

8. Bhalla, G. S., "Economic Theory and Public Enterprise Pricing", *Indian Economic Review*, Vol. XII, No. 2, Oct.—Dec. 1964.

9. Dobb, Maurice, *Socialist Planning : Some Problems*, (London: Lawrence & Wishart Ltd., 1970).

10. Domithorne, A., *China's Economic System*, (London: George Allen & Unwin Ltd., 1967).

11. Government of Bangladesh, Nationalized Industries Division, *Nationalized Industries*, July 1974.

12. ——————————, Planning Commission, *The First Five Year Plan* 1973-78, November 1973.

13. Horvat, Branko, *Towards A Theory of Planned Economy*, (Belgrade: Yugoslav Institute of Economic Research, 1964).

14. ——————, *An Essay on Yugoslav Society*, (New York: International Arts and Sciences Press, Inc. 1969).

15. Kalecki, Michael, "Remarks on Factory Prices, Production Indicators, and Quality Control", *Eastern European Economics*, Vol. VI, No. 1, Fall 1967.

16. Kanesalingam, V., *Pricing Policy of Public Enterprises* (*A Country Study of Selected Public Enterprises in Ceylon*), Industrial Development Board of Ceylon, 1972.

17. Kapustin, E. I., "Material Incentives and Raising Efficiency in the Utilization of Labour Resources in the USSR", in Dunlop, John T. and Fedorenko, Nikolay P. (ed.) *Planning and Markets : Modern Trends in Various Economic Systems*, (New York: McGraw-Hill Book Company, 1969).

18. Keshava, G. P., "Appraisal of Managements' Performance in Public Enterprises", *Arthaniti*, Vol. X, Nos. 1 and 2, January and July 1967.

19. Ladakwala, D. T., "Contribution of Public Enterprises", *The Indian Economic Journal*, Vol. VII, No. 4, April 1960.

20. Knauthe, Erhart habil, "Financing of Nationally Owned Industry in GDR", The Institute of National Planning, United Arab Republic (Mimeo).

21. Macesich, George, *Yugoslavia, The Theory and Practice of Development Planning*, (Charlottesville: The University Press of Virginia, 1964).

22. Mirrlees, J. A., "The Price Mechanism in a Planned Economy", in Dunlop, John T. and Fedorenko, Nikolay P. (ed.), *Planning and Markets: Modern Trends in Various Economic Systems*, (New York: McGraw-Hill Book Company, 1969).

23. Montias, John M., *Economic Development in Communist Rumania*, (Cambridge: The M. I. T. Press, 1967).

24. Pavlov, Yu M., "Economics and Management of the National Economy" in Dunlop, John T. and Fedorenko, Nikolay P. (ed.), *Planning and Markets: Modern Trends in Various Economic Systems*, (New York: McGraw-Hill Book Company, 1969).

25. Sik, Ota, "Prices in the New Economic System of Management in a Socialist Economy", in Dunlop, John T. and Fedorenko, Nikolay P. (ed.), *Planning and Markets: Modern Trends in Various Economic Systems*, (New York: McGraw-Hill Book Company, 1969),

26. ______, *The Bureaucratic Economy*, (New York: International Arts and Sciences Press, Inc., 1972).

27. Szikszai, Bela, "Changes in the Price System and in the Price Mechanism in Hungary", in Dunlop, John T. and Fedorenko, Nikolay P. (ed.), *Planning and Markets: Modern Trends in Various Economic Systems*, (New York: McGraw-Hill Book Company, 1969).

28. United Nations, Technical Assistance Administration, *Some Problems in the Organization and Administration of Public Enterprises in the Industrial Field*, New York 1954.

29. ———————, Technical Assistance Programme, *Public Industrial Management in Asia and the Far East*, New York 1960.

30. Vinogradov, V., *Socialist Nationalisation of Industry*, (Moscow: Progress Publishers 1966).

31. Wilczyrski, J., *Socialist Economic Development and Reforms*, (London: Macmillan 1972).

32. ———————, *Profit, Risk and Incentives Under Socialist Economic Planning*, (London: Macmillan 1973).

33. Wiles, P. J. D., *The Prediction of Communist Economic Performance*, (Cambridge: The University Press 1971).

34. Zaleski, Eugene, *Planning for Economic Growth in the Soviet Union* 1918-1932, (Chapel Hill: The University of North Carolina Press 1971).

Notes and Comments

Tariff Protection and Industrialization in Nigeria : A Comment

by

JAGDISH N. BHAGWATI*

Nothing succeeds like success; and "plausible" regressions are no exception to this rule. Dr. Oyejide has produced several interesting regressions [3] and will doubtless persuade many of us that higher effective tariffs in Nigeria have led to higher import-substitution ratios (cross-sectionally across 42 industries). But it is necessary, for the more skeptical among us, to spell out the serious difficulties that attend the construction of a theoretical rationale for such a conclusion, in partial as also general equilibrium analysis.

(1) If each of the 42 activity-groups considered were "small" so that partial equilibrium analysis were considered adequate for each of them, then one would further have to assume for Dr. Oyejide's hypothesis to hold that the partial-equilibrium supply and demand curves are identical, or at least broadly similar, across the industries.

(2) In addition, note that Dr. Oyejide works with effective tariffs. Now, the effect on the import-substitution (production-to-total-supply) ratio is not uniquely determined by the effective tariff; for the same effective tariff is compatible with different combinations of nominal tariffs on output and inputs and hence with different effects on production and consumption of the output. Hence, even if the partial-equilibrium supply and demand curves were identical across the (42) industries, the hypothesis postulated by Dr. Oyejide would not follow: unless

---

*Professor of Economics, Massachusetts Institute of Technology. Research support by the National Science Foundation is acknowledged.

the input-output structure and the structure of nominal tariffs on each industry's outputs and inputs were identical.

(3) Once we go beyond partial into general equilibrium analysis, furthermore, the hypothesis refuses to hold up for the further reason that the theory of general equilibrium tells us unhappily that if, in an n-output $(n>2)$ economy, if more than one price changes, the direction of output changes cannot be predicted (qualitatively, in Samuelson's sense): one really has to work out the full general equilibrium solution. Thus, if there are n (>2) different tariffs, resulting in n prices changing, there is no theoretical presumption at all for asserting that the changes in the n activities' outputs will be correlated with the n tariffs. This nihilistic conclusion carries over, of course, to a general equilibrium model with imported inputs as well.[1]

(4) Finally, while the analytical points made above relate to the effects of the tariffs vis-a-vis the free trade situation, with given resources, Dr. Oyejide's exercise relates to a situation of growing resources. But, in this event, there is even less presumption theoretically in support of his hypothesis. Take a simple 2-sector example, using the standard two-by-two model of trade theory. We know from Rybczynski's theorem that the supply curves of the two commodities will shift differentially rather than identically, so that even if the supply curves were identical in the initial situation across activities, they would cease to be so with economic expansion except in the singular case of uniform expansion by all factors. And hence any effect of the tariff structure on the import-substitution ratio would be "muddied" by this additional, growth effect. This is clearly a pertinent point when one is relating the import-ratios for 1967, for example, to effective protection in 1962: a period over which the capital stock may have increased by nearly 30% (assuming a capital-output ratio of 3 : 1 and an average savings rate of 15% of GNP) and certainly faster than the labour force.

---

[1] In fact, for predicting output changes (as Dr. Oyejide must do, given his interest in the import substitution ratio), as distinct from "value added" changes, in models with imported inputs, the effective protection measures run into trouble even if we confine ourselves to two goods. This problem was first raised by V. K. Ramaswami and T. N. Srinivasan[4] and is extensively analysed in the contributions of M. Bruno and J. Bhagwati and T. N. Srinivasan in the Symposium on the theory of effective protection in general equilibrium in the Journal of *International Economics*, Vol. 3 (3) (August 1973).

Thus, even within the confines of our neoclassical economic theory, I have serious difficulties with Dr. Oyejide's basic hypothesis that higher effective tariffs lead to higher import-substitution ratios on a cross-sectional basis. In the context of actual LDC economies, these difficulties are accentuated indeed: the growth of industries is likely to reflect distortions arising from differential grade and domestic taxes and subsidies, industrial licensing and targetting, anticipation of tariff and QR protection (as distinct from initial protection) once the industry has built upto size leading to an effective political pressure group,[1] etc. Nonetheless, Dr. Oyejide's exercise is of interest and should serve as an important point of departure for a further analysis of the explanation of the composition of Nigeria's industrialization and the evolution of its tariff structure.

---

[1] Thus, the causal relationship may well run from the growth and size of an industry to the magnitude of its tariff protection. In fact, it is only recently that economists have begun to concern themselves with the question of why tariff structures are what they are, as distinct from what they should be. At an institutional-analytical level, the work of Padma Desai on the criteria used by the Indian Tariff Commission in granting tariff protection represents one approach of interest and importance[2]. At a statistical-econometric level, the work of Travis, Basevi, *et. al.* on examining the factor intensity of protected industries in the United States represents a different, and equally useful approach; for an interesting analysis of the relationship between the labour force characteristics of an industry and the degree of exemption secured by it from the across-the-board 50% tariff cut in the Kennedy Round, see John Cheh [1].

REFERENCES

1. Cheh, John, "United States Concessions in the Kennedy Round and Short-Run Labour Adjustment Costs," *Journal of International Economics* 1975 (forthcoming).

2. Desai, Padma, *Tariff Protection and Industrialization: A Study of the Indian Tariff Commission at Work* (Delhi: Hindustan Publishing Corporation, 1970).

3. Oyejide, T. Ademola, "Tariff Protection and Industrialization via Import Substitution: An Empirical Analysis of the Nigerian Experience", *The Bangladesh Economic Review*, Vol. I, No. 4, October 1973.

4. Ramaswami, V. K. and Srinivasan, T. N., "Tariff Structure and Resource Allocation in the Presence of Substitution", in Bhagwati, J. *et. al.* (eds.), *Trade, Balance of Payments and Growth* (North-Holland: Amsterdam, 1971).

Adjustment Dynamics and the Elasticity of Substitution: The Case of Manufacturing Activity in Bangladesh

by

L. DEMERY AND H. JAHANGIR

I. INTRODUCTION

A number of studies have lately appeared attempting to estimate the elasticity of substitution between capital and labour in the industrial sectors of underdeveloped countries.[1] Azizur Rahman, in his recent paper[9] has attempted to do the same for Bangladesh. His results suggest that substitution possibilities do exist and are obviously of considerable relevance to the formulation of policy. Together with many of the other contributors, Rahman does little to indicate the heroic nature of the assumptions he makes. He follows Arrow, Chenery, Minhas and Solow (ACMS) [1] in regressing value added per man on the wage rate. In doing so, he is open to a number of important criticisms. Even given the ACMS view of the production process, Rahman fails to take account of adjustment costs and time lags which inevitably assume importance in time series estimation. Furthermore, a number of the specific assumptions made by ACMS are unlikely to hold in the Bangladesh case. Finally, if we leave the neo-classical paradigm of *ex post* substitutability, the results hold very little meaning.

II. SUBSTITUTION AND ADJUSTMENT DYNAMICS

An assumption implicit in Rahman's approach is that little or no time is required for factor mixes to respond to changes in factor prices. Entrepreneurs who are faced with changing factor prices are deemed able and willing to make immediate changes in factor combinations according to their profit maximizing intentions. Even if *ex post* substitution is feasible, entrepreneurs are unlikely to instigate immediate changes, since a number of costs are likely to arise

---

[1] See Behrman [2], Clague [4], Katz [8], Sankar [10], Sicat [11] and Williamson [12].

as a result of making adjustments. We therefore reformulated Rahman's analysis by introducing adjustment lags[1].

By postulating a C. E. S. production function under constant returns to scale and competitive factor markets, we derive the familiar relation[2]

$$\log V_t^* = \log a + b \log W_t + \log g_t, \tag{1}$$

where V = value added per man, W = wage rate, g = neutral influence of time, t = time subscript, and * denotes optimum values.

Under these assumptions it can be shown that b = the elasticity of substitution (σ). Since optimum values of V are not directly observable, a Koyck-Nerlove adjustment process is assumed whereby

$$\log V_t - \log V_{t-1} = \lambda(\log V_t^* - \log V_{t-1}). \tag{2}$$

To derive the estimating equation, equations 1 and 2 are combined to get

$$\log V_t = \log \lambda a + \lambda b \log W_t + \lambda \log g_t + (1 - \lambda) \log V_{t-1}. \tag{3}$$

This model is further developed for estimation purposes. Following Kaneda [7] and Williamson [12], cross section and time series data are pooled, in order to avoid the problem of small samples.[3] Within each j^th^ sector, all firms are assumed to have identical parameters. For each i^th^ three or four digit industry, we may write

$$\log V^j_{it} = \log \lambda^j a^j_i + \lambda^j \log g^j_t + \lambda^j b^j \log W^j_{it} + (1 - \lambda) \log V^j_{it-1}. \tag{4}$$

Taking means across i for each t, and subtracting actual observations from industry group (j) means, we generate data consisting of deviations around industry group means (denoted by primes).

$$\log V'_{it} = \log \lambda a'_i + \lambda b \log W'_{it} + (1 - \lambda) \log V'_{it-1}. \tag{5}$$

The estimation of equation (5) by ordinary least squares yields estimates for σ, the elasticity parameter, and λ, the adjustment parameter.

---

[1] This section relies heavily on two earlier studies, J. R. Behrman [2] and J. G. Williamson [12].

[2] A. C. M. S. [1].

[3] This is clearly a weakness of Rahman's estimates, since they are based on only 6 or 8 observations.

The Census of Manufacturing Industries [3] provides the main data, covering the period 1962/63 to 1965/66. Gaps in previous years and the unavailability of data for more recent years, have confined the time series to only four years. Industries were grouped into six sectors in order to generate the cross section data. Apart from sector VI, which includes a rather heterogenous group of activities, the assumption of identical parameters within sectors seems plausible. The i^{th} level of disaggragation within sectors varies from 7 for sector III to 36 for sector V.

The main results are reported in the appendix. In general they pass all the traditional tests of significance. In most cases more than a half of the variance in V_t is explained, and coefficients are always greater than their standard errors.

TABLE I

ESTIMATES OF THE ELASTICITY OF SUBSTITUTION IN BANGLADESH BY SECTOR

Sectors		Rahman's Sectors	
All Manufacturing	1.68	All Manufacturing	.66
Sector I.	2.73	Food	.22*
		Sugar	1.13
		Edible Oils	1.50
		Tea	0.20*
Sector II.	2.61	All textiles	1.01
		Footwear	0.75*
		Jute Pressing	1.84*
		Leather	1.42
Sector III.	3.00		
Sector IV.	1.01	Chemicals	0.43*
Sector V.	1.16	Metals	1.30
		Transport	1.54
Sector VI.	1.52	Paper	.46*
		Non-metallic products	.60*
		Glass	1.42

*Not significant at levels ≳ 10%.

Sources: [9; p. 176].

It is immediately obvious that the elasticity parameters estimated by the model are much greater than those indicated by Rahman. Table I summarizes these differences.

For manufacturing as a whole, our estimate of 1.68 compares with .66 estimated by Rahman. In all sectors, $\hat{\sigma}$ is greater than unity varying from 1.007 in Sector IV to 3.002 in Sector III. In most cases, our estimates indicate greater long run flexibility.[1] Thus estimates of the elasticity parameter are noticeably affected when explicit allowance is made for adjustment time. It might be thought that our results are preferable, since they are derived from a more realistic model, but for a number of reasons, discussed below, we are reticent to claim that these figures represent the true elasticities. Our analysis does underline, however, the importance of model specification, since the estimates seem to be particularly sensitive to the assumptions made.

III. THE MODEL VERSUS THE REAL WORLD

It is not at all certain that merely introducing adjustment costs will yield sufficiently accurate estimates of σ. To begin with some of the assumptions underlying the model might not be appropriate in a developing economy like Bangladesh. The assumption of competitive factor markets is one. This assumption is essential if the regression coefficient is to be identified with σ.[2] Even if capital were perfectly malleable, without a perfectly competitive labour market there are no grounds for believing that $b=\sigma$. It might be argued that in manufacturing activity in Bangladesh labour markets are likely to be monopsonistic, given the relatively recent development in the production of manufactures. Furthermore, the prevalence of a number of market distortions suggest that the wage rate in manufacturing is unlikely to be determined by the marginal product of labour. The existence of minimum wage legislation and the activities of trade unions and multinationals (not to mention the government as a major employer of labour) illustrate ways in which the market might be far removed from the competitive model. It is difficult to assess the structure of the labour market in Bangladesh

---

[1] The exception being Sector V where our 1.16 compares with Rahman's 1.30 and 1.54.

[2] See Harcourt [6; p. 54]

without undertaking a detailed study, but the existence of a large pool of urban unemployed makes one rather doubtful about the applicability of the neo-classical model to labour market behaviour.

In Section II we assumed that capital is malleable in the *ex post* sense, albeit involving adjustment costs to change its form. In so far as machines, once built, have severely restricted substitution possibilities, substitution is only meaningful in *ex ante* terms. If this is the case, it is only the elasticity of substitution of the 'best practice' techniques, or latest vintages, which is relevant.[1] However, the data for value added and numbers employed relate to all 'vintages' currently being employed The estimates derived from these data, therefore, reveal very little about the elasticity of substitution of techniques available to entrepreneurs involved in making investment decisions

Harcourt [5] has uncovered some of the biases present when cross-section data are used. In time series analysis (which has characterized most of the studies in underdeveloped countries) similar biases may arise. For instance, the increase over time in the wage rate might render uneconomic old and less productive vintages. As they are scrapped, V will rise. Consequently, a positive association between V and W may arise, but this has nothing to do with the elasticity of substitution. Whatever the direction of the bias that is introduced it is clear that the use of simple, abstract models for estimating production parameters is an extremely hazardous procedure.

IV. CONCLUDING OBSERVATIONS

Of the several attempts to estimate σ in developing countries, Rahman's paper seems to suffer from more faults than most, being grounded in the highly unreal world of timeless and costless malleability. The introduction of adjustment costs modified his results considerably but the present authors do not suggest that their estimates are the best available. If it is held that substitution can only take place in the *ex ante* sense, then both models fail to provide meaningful estimates.

---

[1] Although even this implies that businessmen are sufficiently myopic to allow current (as opposed to expected) factor prices to determine their choice of techniques.

REFERENCES

1. Arrow, K. J., Chenery, H. B., Minhas, B. S., and Solow, R. M., 'Capital-Labour Substitution and Economic Efficiency', *The Review of Economics and Statistics*, Vol. XLIII, August 1961.

2. Behrman, J. R., 'Sectoral Elasticities of Substitution between Capital and Labour in a Developing Economy: Time Series Analysis in the Case of Post-war Chile'. *Econometrica*, Vol. 40, No. 2, March 1972.

3. Central Statistical Office, Government of Pakistan, *Census of Manufacturing Industries.*

4. Clague, C. K., 'Capital-Labour Substitution in Manufacturing in Underdeveloped Countries'. *Econometrica*, Vol. 37 (1969).

5. Harcourt, G. C., 'Biases in Empirical Estimates of the Elasticities of Substitution of CES Production Functions', *Review of Economic Studies*, Vol. XXXIII (1966).

6. ————, *Some Cambridge Controversies in the Theory of Capital*, Cambridge University Press, Cambridge 1972.

7. Kaneda, H., 'Substitution of Labour and Non-labour Inputs and Technical Change in Japanese Agriculture', *Review of Economics and Statistics*, Vol. 47, May 1965.

8. Katz, J. M., *Production Functions, Foreign Investment and Growth: A Study based on the Argentine Manufacturing Sector*, 1946-1961. Amsterdam: North-Holland Publishing Co., 1969.

9. Rahman, A. N. M. A., 'Elasticities of Substitution in Manufacturing Industries of Bangladesh: An International Comparison', *The Bagnladesh Economic* Review, Vol. I, No. 2, April 1973.

10. Sankar, U., 'Elasticities of Substitution and Returns to Scale in Indian Manufacturing Industries', *International Economic Review*, Vol. II, No. 3, October 1970.

11. Sicat, G. P., 'Capital-Labour Substitution in Manufacturing in a Developing Economy: the Philippines,' *The Developing Economies*, Vol. VIII, No. 1, March 1970.

12. Williamson, J. G., 'Relative Price Changes, Adjustment Dynamics and Productivity Growth : the Case of Philippine Manufacturing', *Economic Development and Cultural Change*, Vol. 19, No. 4, July 1971.

Appendix

REGRESSION RESULTS

Industry Group	Intercept	V_{t-1}	W_t	λ	σ	R^2
All Manufacturing	—0.0393 (0.0170)	0.4039 (0.0590)	1.0053 (0.1210)	0.597	1.683	.54
Sector I	—0.0621 (0.0531)	0.3310 (0.1076)	1.8317 (0.2949)	0.669	2.736	.75
Sector II	—0.0786 (0.0331)	—0.1978* (0.1609)	2.0906 (0.3648)	1.198	2.606	.61
Sector III	—0.0070 (0.0266)	0.6655 (0.3261)	1.0068 (0.4230)	0.335	3.002	.80
Sector IV	—0.0233 (0.0482)	0.3031 (0.1809)	0.7021 (0.3030)	0.697	1.007	.42
Sector V	—0.0148 (0.0276)	0.6171 (0.1165)	0.4448 (0.2315)	0.383	1.159	.47
Sector VI	—0.0512 (0.0360)	0.6988 (0.1493)	0.4602* (0.3083)	0.302	1.523	.71

Figures in parenthesis refer to standard errors.

*Not significant at 10% level.

Definition of Sectors (i^{th} level of disaggregation)

I. Food Manufacturers, Beverages and Tobacco Manufacturers (14)

II. Manufacturers of Textiles, Footwear, other wearing apparel or made up textile goods (15)

III. Manufacturers of Wood, Cork and Furniture and Fixtures (7)

IV. Manufacturers of Rubber products, except Rubber Footwear, Chemicals, and Chemical products (14)

V. Basic metals, Metal products, Machinery and Transport Equipment (36)

VI. Paper and Paper products, printing and publishing, non-metallic minerals, and miscellaneous industries (16).

Book Review

Pakistan : Failure in National Integration by Rounaq Jahan ; Oxford University Press, Dacca, 1973 : ix+ 248 Pages ; Tk. 35.00.

Modern Anglo-American political science seems to consist mainly of a set of verbal habits, rather than of a concerted effort to understand, analyze, and illuminate reality. There are also elements reminiscent of Pythagorean numerology, as witness Lucian Pye's "six crises" and Myron Weiner's "five tasks". There is a love of "order" that comes through not only in the preoccupation with the prerequisites of systemic stability, but also in the fondness for neat classificatory schemes, purported to be of universal applicability.

Rounaq Jahan's book reflects the uneasy and unresolved tension between a commitment (perhaps purely tactical—this is a revised version of her doctoral dissertation) to this school of political science and a sense of reality that keeps breaking through in the course of the narration. Unfortunately, the commitment, tactical or otherwise, was firm enough to ensure that most of the questions that I would find interesting would not even be posed, let alone answered. In political science at in economics, that indeed is the main ideological impact of a Western education : not that one absorbs the wrong answers, but that one is taught systematically to ask the wrong questions. (I abstain from discussing the grounds on which one judges a question to be "right" or "wrong"—at the risk of appearing to imply that the only right questions are those that interest me ! But perhaps I should point out that it is chiefly a matter, not of rightness or wrongness as such, but of the point of view implicit in the choice of questions).

Rounaq Jahan seems to perceive the basic problem of Pakistan as that of a conflict between the processes of "state-building" and "nation-building", "In the newly emerging states of Africa and Asia, the problems of nation-building are compounded by the fact that the ruling elite must perform the seemingly independent and sometimes contradictory tasks of state-building and nation-building simultaneously. The prime necessity of the state's survival as an independent international entity often pushes the governing elite to concentrate on state-building at the cost of nation-building. By overemphasizing the need for the concentration of authority, the maintenance of law and order, economic development, and the establishment of an efficient administrative apparatus, the ruling elite in the new states often underestimate the need to nourish and strengthen political process" [p. 3].

Thus by implication the whole problem is reduced to one of a simple error of judgment. An alternative hypothesis—that "the prime necessity of the state's survival" is no more than an excuse to justify a policy of centralization dictated by the interests of class domination—does not seem to have suggested itself to her.

The concept of class as an analytic construct is of course sedulously avoided. She prefers to operate with the concept of "elite"—a fuzzy and mytifying (in the marxist sense) concept that puts on a par civil servants, businessmen, landlords, and army generals. Such a formulation effectively prevents one from asking questions about the relations of accommodation/domination among these disparate groups, or about the general conditions under which the civil-military bureaucracy may be expected to acquire a certain degree of autonomy—or about the extent to which the civil-military bureaucracy in Pakistan in fact simply served some alliance of classes. This ambiguity in the conceptual framework leads naturally to ambiguities of exposition. Thus in discussing the 1958 coup, she says, "The military coup did not bring about any fundamental change in the elite structure, as it was a defensive maneuver on the part of the ruling elite to thwart the challenge of the vernacular elite" [pp.54-55]. Yet her own discussion on the following pages as well as other sources make it clear that there probably was a fairly important shift in the class base of the regime—roughly from landlord-merchant to rich-farmer-capitalist. Nor was this change without import for inter-wing relations—it was this new class base, rather than a sudden concern with "nation-building", that necessitated a change in central policy towards East Pakistan.

Even more unsatisfactory is her treatment of developments in East Pakistan. According to her, "From the viewpoint of east-west integration, the most crucial development during the first decade was the rise of a vernacular elite in East Pakistan". And, "The ascent of the vernacular elite to power within the relatively short period of seven years was due partly to preexisting factional opposition to the "national" elite and partly to the inept policies followed by that elite and its allies in the center" [pp. 38-39]. This, it seems to me, is totally inadequate either as a characterization of the new "elite", or as an explanation of its rise to power. A footnote does try to indicate the class bases of this emergent elite, but in a cursory fashion. (We learn, for example, that "the vernacular elite found themselves in a position of strength because of their numerical superiority"—surely not a very convincing explanation). Any adequate explanation would have to start with the class bases of the Pakistan movement, including the regional variation in these bases, and proceed via an in depth discussion of rural class structure in East Bengal to considerations of the economic and social impact of the partition. Similarly, subsequent political developments should have been integrated with an analysis of economic and social change, particularly in the countryside. Rounaq Jahan however is content to deal with inter and intra-party conflicts, as well as military-administrative interventions, as more or less *sui generis* phenomena. This is no doubt due to her belief that "politics in Pakistan...is still best characterized as the politics of status, and there are few political links between the elite and other groups" [p.5]. While this statement as such is probably accurate enough, it does not mean that the action of the various elites can be adequately explained without reference to developments at the base. If I may use a simile, any physics undergraduate knows that you cannot explain how a horse can pull a carriage as long as you think only in terms of these two elements of the system: you have to bring in the earth as well.

This neglect of the ground beneath one's feet is rather dramatically illustrated in the author's attempt at a quantitative analysis of the 1965 election results. Using "modernization" variables like "per capita income from agriculture and industry, rate of school enrolment, literacy, and urbanization, percentage of non-agricultural labour force, rate of industrialization, and electricity consumption" [p. 133]. She tries to find a regression equation that will go some distance towards explaining the percentage of votes cast for Miss Jinnah. She reports the results of four multiple regression runs; in all of them the r^2 is insignificant—the highest being 0.118.

If I had been doing a similar exercise, I would have picked as my independent variables some indicators of the structure of rural society in the various districts.

In fact a regression of Miss Jinnah's percentage vote on the percentage of farms under 2.5 acres yields a correlation coefficient of 0.59 ($r^2=0.35$). Thus the "unmobilized strata" can be "politically relevant".

The author's explanation for the final disintegration of Pakistan is also, to my mind, unpersuasive. "In the final analysis", she tells us, "the union could not be saved because the ruling elite was not willing to renounce its fundamental interests, even though the election results clearly signalled the victory of the counterelite, and the counterelite in the east and west, with divergent power bases, could not accommodate each other. The counterelite in East Pakistan was no longer interested in saving the unity of Pakistan, if this were to be done again at the expense of the Bengalis; and the counterelite in West Pakistan did not care to save a union that was no longer profitable to them" [p. 197]. This postulates that while the ruling elite perceived continued union to be profitable to them, indeed vital to their "fundamental interests", the "counterelite" in West Pakistan had no such stake in the unity of Pakistan. The least one could expect is an analysis of the class nature of the two elites that created this divergence in (real or merely perceived) self-interest. Such an analysis is not forthcoming, nor, as far as I could see, implicit in earlier discussions.

One dissappointing aspect of the book is the absence of any primary material. We are informed that the author "collected data and conducted interviews in Pakistan during the spring and summer of 1968". Yet unless I am mistaken, the sole results of this research activity are the four tables on pp. 120-121 (even these only partly from unpublished sources) and two or three not absolutely indispensable footnote references.

My concluding judgement would be that this book is useful as a narrative of events, particularly for non-specialists, but quite inadequate as an aid to understanding those events. On the whole, a disappointing book—particularly disappointing to those who, like myself, know the author personally and have a high opinion of her.

Bangladesh Institute of Development
Studies, Dacca.

Abu Ahmed Abdullah

INTERNATIONAL ECONOMIC REVIEW

Published jointly by the Wharton School of Finance and Commerce, University of Pennsylvania and the Osaka University Institute of Social and Economic Research Association

Editor : E. Burmeister (University of Pennsylvania)
Co-Editor : K. Kuga (Osaka University)

Volume 15 **June 1974** **Number 2**

CONTENTS

SYMPOSIUM

Econometric Model Performance: Comparative Simulation Studies of Models of the U. S. Economy

Part I : (Contents listed inside)

OTHER CONTENTS

The Review is published fully in English, three times a year. The subscription price for individuals (for the subscriber's personal use only and the copies should not be made available to institutions) is $15.00 per year outside Japan and Y4,600 per year in Japan. The institutional subscription price is $25.00 per year outside Japan and Y7,700 in Japan. The price of a single copy is $8.50 outside Japan, Y2,700 in Japan. Subscriptions outside Japan should be forwarded to The International Economic Review, Department of Economics, McNeil Building CR, University of Pennsylvania, Philadelphia, Pa. 19174, U. S. A. Subscriptions in Japan should be forwarded to The International Economic Review, Osaka University Institute of Social and Economic Research Association, 1-1 Machikaneyama-cho, Toyonaka, Osaka 560, Japan.

Manuscripts for publication and editorial communications should be sent in triplicate to the Editor or the Co-Editor of the Review.

SOCIAL AND ECONOMIC STUDIES

Published by

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF THE WEST INDIES
JAMAICA, WEST INDIES

A Journal devoted to the publications of research and discussion on agricultural, anthropological, demographic, economic, educational, monetary, political and sociological questions, with emphasis on the problems of the developing territories, particularly those in the Caribbean.

Vol. 23 June 1974 No. 2

SPECIAL NUMBER

Issues of Public Policy and Public Administration in the Commonwealth Caribbean

Edited by: G. E. Mills

Subscription Rates:
Per volume: J$6.00, W.I. and T.T. $14.40, £3.00, U.S. $7.50
Single number: J$2.00, W.I. & T.T. $4.80, £1.00, U.S. $2.50

Subscriptions and orders for back numbers should be addressed to:
The Publications Editor, *Social and Economic Studies,*
Institute of Social and Economic Research,
University of the West Indies, Mona, Kingston 7, Jamaica.

ARTHA VIJNANA

Quarterly Journal of the Gokhale Institute of Politics and Economics, Poona 4—India

Vol. 16 June 1972 No. 2

CONTENTS

Exploitation of Forests Through Forest Labour Co-operatives in Maharashtra

S. W. MURANJAN

Subscription Rates : (inclusive of postage)
Annual: Rs. 25.00; $7.50; 45s.
Single Issue: Rs. 7.50; $2.00 15s.

Please Address all Correspondence to :
The Editor,
Artha Vijnana,
Gokhale Institute of Politics and Economics, Poona 4 (INDIA)

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

(Organ of the Indian Society of Agricultural Economics)

Vol. XXIX January-March 1976 No. 1

CONTENTS

SUPPLEMENT TO CONFERENCE NUMBER:

OCTOBER-DECEMBER, 1973

ARTICLES:

RESEARCH NOTES:

Individual Membership Fee: Rs. 25 or £3.50 or $8.00 Post free.

Institutional Membership Subscription: Rs. 40 or £5.00 or $12.00 Post free.

Subscription and orders for back numbers should be addressed to ; The Honorary Secretary, The Indian Society of Agricultural Economics, 46-48, Esplanade Mansions, Mahatma Gandhi Road, Fort, Bombay—40023 (India)

REVUE TIERS—MONDE

Tome XV, n° 57, janvier-mars 1974

POUVOIR, MYTHES ET IDEOLOGIES

sous la direction du Professeur Guy CAIRE

PERTINENCE DE L'IDEOLOGIE

Guy CAIRE	: Idéologies du développement et développement de l'ideologie.
Georges LABICA	: Pour une approche critique du concept d'ideologie.
Jacques AUSTRUY	: La transformation du pouvoir dans le début du développement économique.
Celso FURTADO	: Le mythe du developpement et le futur du Tiers-Monde.
Guy de LACHARRIERE	: Aspects mythiques des doctrines relatives au commerc international.
Jean MOULY	: L'emploi dans la pensée relative au développement économique.
Odette GUITARD	: Organisation politique du Tiers-Monde de Bandoung á Santiago.
Gérard DESTANNE de BERNIS	: Le sous-développpement, analyses ou représentations.

LES IDEOLOGIES MOBILISATRICES

Yves BENOT	: Idéologies, nation et structures sociales en Afrique noire.
Tomas Amadeo VASCONI et Marco Aurelio GARCIA de ALMEIDA	: Le devéloppement des idéologies dominantes en Amérique latine.
Jan DELEYNE	: Idéologie et developpement en Chine Populaire.
Maria Isaura PEREIRA DE QUEIROZ:	: Mythes des paysans brésiliens.
Alain TOURAINE	: Mouvements sociaux et idéologies dans les sociétés dépendantes.
Christian PALLOIX	: Impérialisme et mode d'accumulation international du capital. Essai d'dune approche du néo-impérialisme.
Yves LAULAN	: Les nouveaux mythes : pollution et evnironnement.

Direction-Rédaction : Institut d'Etude du Développement Economique et Social 58, boulevard Arago—75013-PARIS.
Abonnements et vente : Presses Universitaires de France, 12, rue Jean de Beauvais 75005-PARIS
France : F. 76,00 Etranger : F. 85,00

REVUE TIERS—MONDE

Tome XV, n° 58, avril—Juin 1974

Milton SANTOS : Sous-développement et pôles de croissance économique et sociale.

Aimé TEYSSIER d'ORFEUIL : Financement externe et codes des investissements.

David McKEE et William H. LEAHY : Le duailsme et l'intégration économique régionale et urbaine.

Moises IKONICOFF : Concentration du revenu, grandes firmes multinationales et modele dè développement en Agrentine.

Georges FISCHER : Un trait d'union: Annie Besant (1847-1933).

S. I. F. I. : Reflexions sur l'article de Christian PALLOIX paru dans Tiers-Monde n° 57.

Denis BERGMANN : Le développement agricole des Petites Antilles. Nécessités et difficultés.

Isaac JOHSUA : Les ensembles agro-industriels. Le cas de l'industrie sucrière cubaine.

Jean-Marie MIGNON : Le Plan communal algérien: l'expérience des programmes spéciaux de Constantine et d'Annaba.

M. SADROLACHRAFI : Les nouvelles méthodes d'exploitation agricole dans les villages iraniens.

CHRONIQUE INTERNATIONALE

— Second National Development Research Conference. Université de Norwich, 20-22 septembre 1973.

— La Conférence européenne de la Société Internationale pour le Développement (S. I. D.). Oxford, 24-26 septembre 1973.

— Colloque sur l'analyse des proejcts de développement. Université de Clermont-Ferrand, 12-13 novembre 1973.

— Colloque franco-indien. Paris, Maison des Sciences de l'Homme, 13-15 décembre 1973.

A L'I. E. D. E. S. : Georges FISCHER

BIBLIOGRAPHIE

Direction-Rédaction : Institut d'Etude du Développement Economique et Social, 58, boulevard Arago—75013-PARIS

Abonnements et vente : Presses Universitaires de France, 12, rue Jean de Beauvais, 75005-PARIS.

France : F. 76,00 Etranger : F. 85,00

SOCIAL AND ECONOMIC STUDIES

Published by

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF THE WEST INDIES JAMAICA,
WEST INDIES

A journal devoted to the publications of research and discussion on agricultural, anthropological, demographic, economic, educational, monetary, political and sociological questions, with emphasis on the problems of the developing territories, particularly those in the Caribbean.

Vol. 23 March 1974 No. 1

Subscription Rates :

Per volume: J$6.00, W.I. & T.T. $14.40, £3.00, U.S. $7.50

Single number: J$2.00, W.I. & T.T. $4.80, £1.00, U.S. $2.50.

Subscriptions and Orders for back Numbers should be addressed to :

The Publications Editor, *Social and Economic Studies,*
Institute of Social and Economic Research, University of West Indies, Mona,
Kingston 7, Jamaica W. I.

THE DEVELOPING ECONOMIES

Quarterly Journal of Institute of Developing Economics
42, Ichigaya-Hommura-Cho-Shinjuku-Ku, Tokyo, Japan

Volume XI	December 1973	Number 4

SPECIAL ISSUE: SOUTHEAST ASIA'S ECONOMY AND JAPAN

Changing Patterns of Economic Interdependence in Asia	*Ryōkichi* HIRONO
Philippine Economic Development and Japan in the Future	*Gerardo P.* SICAT
Economic Development of Malaysia: Pattern and Perspective	K. A. M. ARIFF
The Singapore Economy and Its Development Problems	LEE *Soo Ann*
The Impact of Economic Development on the Physical Environment of Singapore	*William S. W.* LIM
Growth and Structural Change in the Manufacturing Sector in Thailand, 1960-69	*Narongchai* AKRASANEE
Formation and Development of the Association of Southeast Asian Nations	*Yoshiyuki* HAGIWARA
Toward Economic Independence of Southeast Asia	*Jun* NISHIKAWA
Japanese Economic Assistance: Trial and Achievement	*Tadashi* KAWATA

Volume XII	March 1974	Number 1

African Socialism and Agricultural Development Strategy: A Comparative Study of Kenya and Tanzania	*Ichirō* INUKAI
Notes on the Chinese Model of Economic Development—Its Impact on and Influence from Foreign Economic Systems	*Katsuji* NAKAGANE
Output vs. "Surplus" Maximization: The Conflicts between the Socialized and the Private Sector in Chinese Collectivised Agriculture	K. K. FUNG
A Simulation Model for Performance Evaluation of Developing Economies	N. K. SARKAR
The Influence of Education on Manufacturing Productivity: The Philippines	*Romeo M.* BAUTISTA
Output-Income Effects of Agricultural Export Pricing in Nigeria: A Comment	*Patrick J.* GORMELY

Book Reviews

Subscription price:
(4 issues): $26.00 (post free)
Single copies: Ordinary issue $6.00;
Special issue $8.00 (post free)

Orders may be sent to the sole agent:
MARUZEN COMPANY, LTD.,
P. O. Box 5050, Tokyo International 100-31, Japan

ARTHA VIJNANA

Quarterly Journal of the Gokhale Institute of
Politics and Economics, Poona 4—India

Vol. 16 September 1974 No. 3

CONTENTS

Subscription Rates (Inclusive of postage)

Annual:	Rs. 25;	$7.50;	45s.
Single issue:	Rs. 7.50;	$2;	15s.

Please address all correspondence to:

The Editor,
Artha Vijnana,
Gokhale Institute of Politics and Economics, Poona 4 (INDIA).

JUST OUT

RESEARCH MONOGRAPH NO. 1

Bangladesh : National Income and Expenditure 1949/50—1969/70

by

MOHIUDDIN ALAMGIR
LODEWIJK J. J. B. BERLAGE

and

RESEARCH MONOGRAPH NO. 2

Saving in Bangladesh : 1959/60—1969/70

by

MOHIUDDIN ALAMGIR
ATIQUR RAHMAN

Price : Soft Cover Tk. 20.00 or US $ 7.50
Hard ,, ,, 30.00 or US $10.00

Please place your orders to :

Publications Officer
Bangladesh Institute of Development Studies
Adamjee Court (1st floor)
Motijheel Commercial Area
Dacca—2, Bangladesh.

SUBSCRIPTION RATES

for

THE BANGLADESH DEVELOPMENT STUDIES

Effective from January 1975

INLAND:	FOREIGN:
General	**Annual**
Taka 7.50 per issue	US $ 15.00 or UK £ 6.00 or
Taka 30.00 per year	equivalent thereof in other currencies
Students	**Single copy**
Taka 4.50 per issue	
Taka 18.00 per year	US $ 3.75 or UQ £ 1.50 or
	equivalent thereof in other currencies

Air postage extra. Payments to be made through bank darfts/postal orders.

Special Publications:

Report on the Seminar on Industrialization and Labour Management Relations held in Karachi in January 1959 (Tk. 3.00 or US $ 1.00) Editor: *M. L. Qureshi*

Population Growth and Economic Development with Special Reference to Pakistan (Tk. 10.00 or US $ 4.00) Editor: *M. L. Qureshi*

Deficit Financing and Capital Formation: The Pakistan Experience, 1951—59 (Tk. 5.00 or US $ 2.00) *By Parvez Hasan*

Partition, Integration, Economic Growth and Interregional Trade: A Study in the Growth of Interwing Trade in Pakistan (Tk. 7.50 or US $ 3.00) *By Dr. Akhlaqur Rahman*

The Economy of Pakistan: A Select Bibliography, 1947—62 and 1963—65. 2 Vols. (Tk. 5.00 or US $ 2.00 each) *By A. H. Siddiqui*

A Bibliography of Pakistan Demography (Tk. 3.00 or US $ 1.00) *By A. D. Bhatti*

Seminar Report on the Current Economic Problems of Pakistan (Tk. 5.00 or US $ 2.00)

The Problems of Teaching Economics is Pakistan (Tk. 5.00 or US $ 2.00) *By E.A.G. Robinson*

A Report of the Seminar on Population Problems in the Economic Development of Pakistan (Tk. 5.00 or US $ 2.00)

Studies in the Demography of Pakistan (Tk. 12.50 or US $ 5.00) Editor: *Dr. W. C. Robinson*

Analytical Techniques for Development Planning: A Case Study of Pakistan's Third Five Year Plan (1965—70) (Tk. 15.00 or US $ 6.00) *By Wouter Tims*

Small and Medium Industries of Pakistan: A Select Bibliography, 1948—62 *By A. Hafiz Akhtar*

Symposium on Planning Experience in Pakistan (Tk. 2.00 or US $ 1.00) Editor: *Dr. A. R. Khan*

Report of the Population Growth Estimation Experiment: Description and Some Results for 1962—1963 (Tk. 6.00 or US $ 2.50)

Final Report of the Population Growth Estimation (Tk. 10.00 or US $ 4.00) Edited By : *M. N. I. Farooqui and G. M. Farooq*

Readings in Development Economics:

No. 1: Studies on the Strategy and Technique of Development Planning Edited By : *Dr. Azizur Rahman Khan*
(Paperback: Tk. 10.00 or US $ 4.00; Cloth Bound: Tk. 19.00 or US $ 7.50)

No. 2: Studies on Commercial Policy and Economic Growth Edited By : *Prof. Nurul Islam*
(Paperback: Tk. 15.00 or US $ 6.00; Cloth Bound: Tk. 25.00 or US $ 10.00)

No. 3: Empirical Studies on Pakistan Agriculture Edited By *S. M. Hussain* and *M. I. Khan*
(Paperback: Tk. 15.00 or US $ 6.00; Cloth Bound: Tk. 25.00 or US $ 10.00)

No. 4: Studies on Fiscal and Monetary Problems Edited By *Swadesh* R. *Bose*
(Paperback: Tk. 12.50 or US $ 5.00; Cloth Bound: Tk. 20.00 or US $ 8.00)

Research Monographs:

No 1: Bangladesh: National Income and Expenditure 1949/50—1969/70 *By Mohiuddin Alamgir* and *Lodewijk J. J. B. Berlage*
(Soft Cover: Tk. 20.00 or US $ 7.50; Hard Cover: Tk. 30.00 or US $ 10.00)

No 2: Saving in Bangladesh 1959/60—1969/70 *By Mohiuddin Alamgir* and *Atiqur Rahman*
(Soft Cover: Tk. 20.00 or US $ 7.50; Hard Cover: Tk. 30.00 or US $ 10.00).

PUBLICATIONS OF
THE BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES
DACCA, BANGLADESH

Quarterly Journal

The Pakistan Development Review: Vol. I—X (Price Tk. 12.00 or US $ 5.00 per vol.)
(Suspended from January 1971)

The Bangladesh Economic Review: Vol. I & II—No. 1 & 2 (price Tk. 30.00 or US $ 15.00)
(Suspended from July 1974)

The Bangladesh Development Studies: (begins from July 1974)
(Annual Subscription: Inland Tk. 30.00; Foreign US $ 15.00 or UK £ 6.00)

Monographs in the Economics of Development (Tk. 5.00 or US $ 2.00 each)

No 1: A Study of Planning Methodology with Special Reference to Pakistan's Second Five Year Plan *By Dr. J. C. N. Fei* and *Dr. G. Ranis*
No. 2: Towards the Application of Interregional Input-Output Models to Economic Planning in Pakistan *By S. M. Naseem*
No. 3: Deficit Financing in Pakistan, 1951—60 *By Dr. M. Haq & Miss Khadija Khanam*
No. 4: A Measure of Inflation in Pakistan, 1951—60 *Monetary* and *Fiscal Section*
No. 5: Industrial Efficiency and Economic Growth: A Case Study of Karachi *By Dr. G. Ranis*
No. 6: Urban Consumer Expenditure and the Consumption Function *By Dr. G. Ranis*
No. 7: Problems of Budgetary Reform in Pakistan *By Mrs. N. Sarfraz*
No. 8: Wages and Prices in Karachi : A Case Study *By A. R. Khan*
No. 9: An Analysis of the Long-Run Prospects of Economic Development in Pakistan *By Dr. J. C. N. Fei* and *others*
No. 10: Liquidity and Lending: Volume of Bank Credit in Pakistan *By R. C. Porter*
No. 11: The Pakistan Export Bonus Scheme *By Dr. N. J. Bruton* and *S. R. Bose*
No. 12: The Use of Agricultural Surplus Commodities for the Economic Development of Pakistan *By Dr. C. Beringer* and *Irshad Ahmed*
No. 13: The People of Karachi: Demographic Characteristics *By Sultan S. Hashmi*
No. 14: Social Characteristics of the People of Karachi *By Imtiazuddin Husain* and *others*
No. 15: The People of Karachi: Economic Characteristics *By G. Mumtaz Farooq*
No. 16: Relative Price Changes and Industrialization in Pakistan, 1951—64 *By Dr. Stephen R. Lewis Jr.* and *S. Mushtaq Hussain*
No. 17: Population Projections for Pakistan, 1960—2000 *By Lee L. Bean* and *others*

Statistical Papers

No. 1: Acreage, Production and Prices of Major Agricultural Crops of West Pakistan (Punjab): 1931—59 (Tk. 5.00 or US $ 2.00) Compiler *A. Rab*
No. 2: The People of Karachi: Data from A Survey (Tk. 20.00 or US $ 8.00) *By Dr. Sultan S. Hashmi* and *others*
No. 3: Imports of Pakistan: Growth and Structure—A Statistical Study (Tk. 10.00 or US $ 4.00) *By Prof. Nurul Islam*

(See Overleaf)

Printed at ABCO PRESS, 6-7 **Aulad Hossain Lane,** Dacca-1 and published
by the Bangladesh Institute of Development Studies, Dacca.

THE BANGLADESH DEVELOPMENT STUDIES

(Formerly The Bangladesh Economic Review)

Volume II October 1974 Number 4

Articles

Some Analysis of Distribution of Income, Consumption, Saving and Poverty in Bangladesh
Mohiuddin Alamgir

Labour Force Status and Fertility
Rafiqul Huda Chaudhury

Brief Reflections on the Central Issues of Policy in Bangladesh
Gustav Ranis

Note

The Supply Responsiveness of Bangalee Rice and Cash Crop Cultivators
John Thomas Cummings

The Quarterly Journal of
THE BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

THE
BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

Adamjee Court, Motijheel Commercial Area, Dacca-2, Bangladesh

The Institute carries out basic research studies on the problems of development in Bangladesh. It also provides training in socio-economic analysis and research methodology for the professional members of its staff and for members of other organisations concerned with development problems.

Manuscript and editorial correspondence should be addressed to the Board of Editors, *The Bangladesh Development Studies,* Adamjee Court, Motijheel Commercial Area, Dacca-2, Bangladesh. Style instructions for guidance in preparing manuscript in acceptable form will be provided upon request.

The Bangladesh Development Studies

Volume II October 1974 Number 4

Articles

Note

Some Analysis of Distribution of Income, Consumption, Saving and Poverty in Bangladesh

by

Mohiuddin Alamgir*

I. INTRODUCTION

The few pioneering attempts to study the trend of rural-urban income and its distribution in Bangladesh and in pre-March 1971 Pakistan were due to Griffin [35], Bergan [10] and Bose [12 ; 13]. Griffin analysed the movement of rural income in Pakistan over the period 1948/49 to 1964/65. He did not provide separate evidence for Bangladesh and his method of identifying rural income with agricultural income has been rightly criticised by Bergan [10, p. 172].[1] Bergan, on the other hand, used quarterly survey data of the Central Statistical Office (C.S.O.) [27] to estimate rural-urban income and saving and to analyse the distribution of income in the two areas of East and West Pakistan for the year 1963/64. In his analysis of income distribution he used the concept of personal income.[2] Khadija Huq [37] studied urban income distribution and its movement over time for pre-March 1971 Pakistan and its regions over the period 1948/49 to 1960/61. Her study was very limited in coverage since she confined her attention only to

---

*The author is a Senior Research Economist at the Bangladesh Institute of Development Studies. He is deeply indebted to Dr. Nuruddin Chowdhury, Director of Research, Bangladesh Bank. He is also indebted to his colleagues Dr. Abdul Ghafur, Dr. R. H. Chaudhury and Mr. Asaduzzaman for helpful comments on an earlier draft. He also gratefully acknowledges the assistance provided by Mrs. Pratima Paul and Mr. A. B. M. Shamsul Islam during the course of the study. However, the author assumes the responsibility for any error.

[1] Griffin's estimate suffers from the shortcoming that on the one hand, he neglects the income originating in rural areas from non-agricultural activities and on the other hand, he does not take account of the fact that a portion of the agricultural income originates in urban areas.

[2] He divided total personal income between rural and urban areas on the basis of rural and urban distribution of population. No reference was made to the rural and urban distribution of the labour force and its productivity. Other limitations relating to blowing up of sample data into regional estimates are too well known to be repeated here.

the group paying income tax which accounted for one tenth of one percent of the population. On saving, aggregate and sectoral, only partial estimates were available until a study recently completed at the Bangladesh Institute of Development Studies [4]. Finally, Bose made the most searching analysis of the movement of the real income per head of agricultural, rural and urban population in Bangladesh over the period 1949/50 to 1963/64. In particular, he was interested in the movement of the real income of the rural poor.

Recently a considerable interest has been shown in many countries, notably India in estimating the magnitude and trend of mass poverty [6; 7; 8; 13; 41]. No such attempt has so far been made in Bangladesh. The present study is an attempt, among others, to fill in this gap in information. The purpose and organisation of the present study are as follows.

First, Bose's study is extended upto 1969/70 to examine the trend of real income per capita of the agricultural, rural and urban population of Bangladesh. However, in the estimates presented here, three significant departures were made from Bose's study. (i) A revised series of national income due to Alamgir and Berlage [3] was used to estimate agricultural, rural and urban factor incomes. (ii) Unlike Bose's study, a labour productivity differential between rural and urban non-agricultural activities particularly in household and cottage industries was assumed here. (iii) The total population series as well as the rural-urban distribution of population in this study for the period following 1959/60 is different from that of Bose's.

Second, the trend in rural-urban income disparity is analysed and some international comparisons are made.

Third, Bose's evidence on the income of the rural poor is extended upto 1973. Bose essentially used wage data provided by the Directorate of Agriculture [15]. An alternative set of wage data starting from 1962 was collected by the Bureau of Statistics [16; 19; 23]. Both sets of data were used here to draw some conclusions regarding the movement of the real income of the rural poor in the late 60's and early 70's.[1] Furthermore, information was also collected

---

[1] Bose himself extended his earlier work in a recently published article in [13]. While the nominal wage rates in the two studies (Bose's and present) agree, the estimated real wage rates are different because of difference in the underlying consumer price index used to deflate nominal wage rates. Construction of consumer price index, used in the present study is explained in Section II.

on the movement of real income of the urban poor. Here again two sets of wage data were used, both provided by the Bureau of Statistics [16; 20; 23]. One set of data relates to the wage of helper (*Jugali*) in construction work and the other relates to the average wage of unskilled workers in all sectors. This has provided the first opportunity to examine the disparity between the rural and urban areas in the living condition of the poor. These aspects of this study are presented in Section II.

Fourth, an attempt is made to analyse the intertemporal changes in the inequality of income distribution in the rural and urban areas of Bangladesh and trace its impact on the real income of the rural and urban poor. For this purpose data provided by C. S. O.'s national sample surveys [26] and quarterly surveys [27] were used. All aspects of income distribution are discussed in Section III.

Fifth, it is examined whether the intertemporal changes in income inequality and the real income of the rural and urban poor had effected any significant change in the pattern of consumer expenditure of the rural and urban population in general, and of various income groups within each area, in particular. Section IV contains the analysis of the distribution of consumer expenditure.

Sixth, the data on consumer expenditure on food and related items of the rural and urban households by income group are used to estimate the magnitude of poverty and its movement over time in Bangladesh. In order to determine the poverty level, a consumption basket per capita is identified which, among others, satisfies such nutritional norms as the minimum number of calories (2100/day) and the minimum amount of protein (45g day) required for an average person. The items in the minimum consumption basket are valued at different prices for rural and urban areas in order to arrive at the poverty level. Measurement of poverty is presented in Section V.

Last but not the least, data from a study by Alamgir and Rahman [4] are used to make an analysis of rural and urban saving in Bangladesh. An attempt is also made to examine the relationship between real income, inequality, poverty and saving. Different aspects of rural-urban saving, are discussed in Section VI. Finally, some concluding remarks are presented in Section VII.

Admittedly, the above represents a tall order, given the state of statistical information in Bangladesh. For obvious reasons, data had to be pooled from a variety of sources in order to carry out the different steps of analysis as described above. Although care has been taken to avoid the use of inconsistent sets of data yet some weaknesses remain in the analysis due to different degree of reliability of data from different sources. Therefore, some caution is warranted in interpreting the results of this study.

II. PER CAPITA FACTOR INCOMES OF AGRICULTURAL, RURAL AND URBAN POPULATIONS

A. Movement of Per Capita Income of Total and Sectoral Populations

The revised GDP series estimated by Alamgir and Berlage [3] has been used to calculate the level and trend of per capita real income of the agricultural and rural population and compare them with those of the per capita real income of non-agricultural and urban population. Basic data, their sources, and methodology of estimation are explained in detail in [3]. It may be pointed out here that differences in GDP and in the agricultural and non-agricultural income series between the present study and Bose's study as shown in Table I are due to revisions made in the official series. The rural and urban income series under present study (1) are derived by assuming a labour productivity differential between rural and urban non-agricultural activities. The rural and urban income series under the present study (2) are derived by applying Bose's methodology which does not take account of the productivity differential mentioned above.

The trend of real income of the agricultural population as well as rural-urban disparity in real income can be studied by analysing the movement of income per head of the agricultural population, rural income per capita and urban income per capita, all measured in constant prices. The population series in Bose's study and in the present study are different for the period following 1959/60. The sources of differences are explained in detail in [3].

Estimates of total agricultural, rural and urban per capita income for the period 1949 50 to 1969/70 prepared for this study along with Bose's estimates are presented in Table II. The mean and the coefficient of variation for each column

TABLE I

GROSS DOMESTIC PRODUCT AND ITS DISTRIBUTION BETWEEN AGRICULTURE AND NON-AGRICULTURE AND RURAL AND URBAN AREAS: BANGLADESH, 1949/50 TO 1969/70

(Tk. million/1959/60 factor cost)

Year	Gross Domestic Product		Agriculture		Non-agriculture		Rural			Urban		
	Present Study	Bose's Study	Present Study	Bose's Study	Present Study	Bose's Study	Present Study (1)	Present Study (2)	Bose's Study	Present Study (1)	Present Study (2)	Bose's Study
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1949/50	11298	12052	7392	8074	3906	3978	9245	10208	10937	2053	1090	1115
1950/51	11905	12495	7802	8344	4103	4151	9748	10760	11332	2157	1145	1163
1951/52	12305	12849	7880	8394	4425	4455	9984	11098	11607	2321	1207	1242
1952/53	12677	13270	8186	8751	4491	4519	10320	11427	12007	2357	1250	1263
1953/54	13253	13737	8556	9048	4697	4689	10787	11946	12428	2466	1307	1309
1954/55	12957	13438	8219	8704	4738	4734	10443	11596	12069	2514	1361	1369
1955/56	12414	12856	7589	8043	4825	4813	9861	11035	11476	2553	1379	1380
1956/57	13740	14062	8639	9012	5101	5049	11001	12226	12458	2739	1514	1604
1957/58	13464	13851	8258	8696	5206	5156	10674	11923	12321	2790	1541	1530
1958/59	12712	13515	7447	8234	5265	5281	9865	11111	11902	2847	1601	1613
1959/60	14161	14548	8546	9042	5615	5526	11119	12448	12875	3042	1713	1693

(Contd.)

TABLE I (Contd.)

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1960/61	14866	15434	8987	9590	5879	5844	10955	13012	13585	3911	1854	1849
1961/62	15987	16368	9446	10012	6541	6356	11577	13801	14361	4410	2186	2007
1962/63	16272	16367	9175	9675	7091	6692	11529	13976	14195	4743	2296	2172
1963/64	17790	18171	9948	10599	7842	7572	12554	15260	15718	5236	2530	2453
1964/65	18073		10084		7989		12739	15495		5334	2578	
1965/66	18686		10339		8347		13074	15912		5612	2774	
1966/67	18869		10375		8494		13159	16047		5710	2822	
1967/68	20536		11336		9200		14351	17479		6185	3057	
1968/69	21139		11162		9977		14442	17834		6697	3305	
1969/70	21504		11469		10035		14766	18178		6738	3326	

Notes and Sources:

(1) All figures quoted under the column head Bose's Study are taken from [12, p. 478].

(2) Col. 1, 3 and 5 [3].

(3) Col. 7 and 10 are estimates assuming differential rural-urban labour productivity in non-agricultural activities. Col. 8 and 11 are estimates based on Bose's methodology. For details see [3].

TABLE II

PER CAPITA INCOMES OF TOTAL, AGRICULTURAL, RURAL AND URBAN POPULATION : BANGLADESH, 1949/50 TO 1969/70

(Taka/1959/60 factor cost)

Year	Gross Domestic Product Per Capita			Agril. Value Added Per Head of Agril. Population			Per Capita Rural Income				
	Present Study (1)	Present Study (2)	Bose's Study	Present Study (1)	Present Study (2)	Bose's Study	Present Study (1)	Present Study (2)	Present Study (3)	Present Study (4)	Bose's Study
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1949/50	267	267	285	209	209	228	229	253	229	253	271
1950/51	275	275	289	215	215	229	235	260	235	260	274
1951/52	277	277	290	211	211	225	235	262	236	262	274
1952/53	279 (276)	279 (276)	292 (289)	214 (212)	214 (212)	228 (226)	238 (235)	263 (260)	238 (235)	263 (260)	277 (274)
1953/54	285	285	295	217	217	230	243	269	243	269	280
1954/55	272	272	282	203	203	216	230	255	230	255	265
1955/56	254	254	263	183	183	194	212	237	212	237	247
1956/57	274	274	281	203	203	212	231	256	231	257	261
1957/58	262 (259)	262 (259)	270 (272)	189 (185)	189 (185)	199 (197)	219 (215)	244 (241)	219 (216)	244 (241)	253 (250)
1958/59	242	242	275	166	166	184	198	223	198	223	238
1959/60	263	262	271	186	186	196	217	243	218	244	252
1960/61	267	269	279	189	190	203	208	247	209	248	259
1961/62	279	289	289	194	195	207	213	254	216	257	267
1962/63	275 (280)	280 (285)	281 (289)	183 (190)	185 (192)	195 (203)	208 (213)	252 (257)	210 (216)	254 (260)	258 (266)
1963/64	292	298	305	194	195	207	220	268	223	271	279
1964/65	288	295		192	194		218	265	220	268	
1965/66	289	298		192	194		218	266	221	268	
1966/67	284	293		188	189		215	262	217	265	
1967/68	300 (294)	311 (305)		201 (194)	202 (195)		229 (222)	279 (272)	231 (224)	281 (275)	
1968/69	300	312		193	194		225	278	227	280	
1969/70	297	309		194	194		225	277	226	279	
Mean	277	280	283	196	197	210	222	258	223	259	264
Coefficient of Variation	0.05	0.07	0.04	0.07	0.06	0.07	0.05	0.05	0.05	0.05	0.04

(Contd.)

TABLE II (Contd.)

Year	Per Capita Urban Income					Per Capita Rural Income as % of Per Capita Urban Income				
	Present Study (1)	Present Study (2)	Present Study (3)	Present Study (4)	Bose's Study	Present Study (1)	Present Study (2)	Present Study (3)	Present Study (4)	Bose's Study
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1949/50	1122	596	1122	596	609	20	42	20	42	44
1950/51	1147	609	1147	609	619	20	43	20	43	44
1951/52	1184 (1149)	616	1184	616	634	20	43	20	43	43
1952/53	1150	610 (610)	1155 (1150)	613 (610)	619 (619)	21	43	21	43	45
1953/54	1158	614	1158	614	615	21	44	21	44	46
1954/55	1132	613	1132	613	617	20	42	20	42	43
1955/56	1100	594	1105	597	597	19	40	19	40	41
1956/57	1132	626	1137	628	666	20	41	20	41	39
1957/58	1107 (1106)	612 (613)	1107 (1109)	612 (615)	607 (621)	20	40	20	40	42
1958/59	1083	609	1087	611	616	18	37	18	36	39
1959/60	1106	623	1110	625	618	20	39	20	39	41
1960/61	1367	648	1363	646	644	15	38	15	38	40
1961/62	1500	744	1475	731	671	14	34	15	35	40
1962/63	1325 (1346)	641 (625)	1520 (1508)	736 (730)	696 (692)	16	39	14	35	37
1963/64	1322	639	1611	778	755	17	42	14	35	37
1964/65	1215	587	1573	760		18	45	14	35	
1965/66	1199	593	1521	752		18	45	15	36	
1966/67	1071	529	1547	765		20	50	14	35	
1967/68	1074 (1086)	531 (537)	1542 (1550)	762 (766)		21	53	15	37	
1968/69	1076	531	1598	789		21	52	14	35	
1969/70	1010	499	1542	761		22	56	15	37	
Mean	1170	603	1321	677	639					
Coefficient of Variation	0.10	0.08	0.16	0.11	0.06					

(Contd.)

TABLE II (Contd.)

Notes and Sources:

1. Col. 1 and 2—Gross Domestic Product in Col. 1 Table I divided by population estimates in Col. 1 and 2 respectively of Appendix Table XX.
2. Col. 3, 6, 11, 16 and 21 —Bose [12, p. 455].
3. Col. 4 and 5—Value added in agriculture taken from Col. 3 of Table I divided by agricultural population in Col. 7 and 8 respectively of Appendix Table XX.
4. Col. 7 and 8—Rural income in Col. 7 and 8 respectively of Table I divided by rural population in Col. 3 of Appendix Table XX.
5. Col. 9 and 10—Rural income in Col. 7 and 8 respectively of Table I divided by rural population in Col. 4 of Appendix Table XX.
6. Col. 12 and 13—Urban income in Col. 10 and 11 respectively of Table I divided by urban population in Col. 5 of Appendix Table XX.
7. Col. 14 and 15—Urban income in Col. 10 and 11 respectively of Table I divided by urban population in Col. 6 of Appendix Table XX.

are presented in the last two rows.[1] Corresponding to two different estimates of total population, particularly for the 60's, two estimates of per capita GDP and agricultural value added are available. Since two separate estimates of rural and urban income were made, on per capita basis four estimates were made using the two different population estimates mentioned above. Revised estimates of per capita GDP are lower than Bose's estimates but the fluctuations revealed appear to be the same as found by Bose with only one difference. For the period 1960-64, Bose's figure was the same as that for 1949-55, while in the present study the former is higher.

In the case of per capita value added in agriculture similar conclusions hold. The estimates of the present study are lower than Bose's. According to present study(1) agricultural value added per capita declined from Tk. 212 during 1949-55 to Tk. 185 during 1955-60, and then increased slightly to Tk. 190 during 1960-65 and Tk. 194 during 1965-70. Figures corresponding to the present study (2) are only marginally different. What is more important to note is that the five yearly averages for agricultural value added per capita during the 60's were far below the level observed for early 50's i. e., 1949-55. Given the population growth, the movement in the agricultural value added per capita can actually be explained largely by the trend in agricultural value added and factors affecting the latter clearly also had some effect on the former. Some of these factors were pointed out in [3 ; 12]. Whatever reservations[2] one may express, it can safely be concluded that no benefit of the so called planned economic development during the Pakistan regime ever reached the agricultural population in general, of Bangladesh.

Per capita rural income, whichever estimate is used, declined between 1949/50 and 1959/60. The level of per capita rural income is lower in the present study than in Bose's but the difference is much greater if one uses the rural-urban pro-

---

[1] The values of the coefficient of variation indicate that all the series are stable around the mean, that is to say there is no evidence of a general trend in a particular direction. In other words over the entire period under consideration there was no significant change in the living condition of any group of people in Bangladesh as indicated by the evidence from time series data on national account. However, one can still compute periodic averages and attempt at explaining the movements in these averages from one period to another.

[2] For discussion of some see Bose [12, p. 458].

ductivity differential assumption which seems more reasonable. This assumption also makes a difference in the movement observed over the entire period. Without the productivity differential assumption, all estimates reveal a declining trend in per capita rural income during the 50's and a slight recovery during early 60's which is maintained in later years so that the average for 1965-70 (Tk.272 for present study (2) and Tk. 275 for present study (4)) is higher than that for 1949-55 (Tk. 260 in both present study (2) and present study (4)). If one takes into account the rural-urban productivity differential, the recovery trend of the 60's is still observed but the level of early 50's is never reached and this result is consistent with the trend revealed by agricultural value added per capita.

What is perhaps more interesting is the disparity in rural-urban income and its movement over time. First a few words are in order on the movement of per capita urban income. In this case it is found that the trend over time is affected by both the productivity differential assumption as well as by the underlying population series. Bose found a consistently upward trend over time in urban per capita income which is also supported by present study(4). According to this estimate urban income per capita goes up from Tk. 596 in 1949/50 to Tk. 625 in 1959/60, Tk. 760 in 1964/65 and Tk. 761 in 1969/70. As for periodic averages, the figure moves from Tk. 610 for 1949-55 to Tk. 615 for 1955-60, Tk. 730 for 1960-65 and Tk.766 for 1965-70. However, the present study (2) while supporting Bose's findings for the period covered by both, reveals a declining trend for the late 60's. From an average of Tk. 652 for 1960-65 the figure comes down to Tk. 537 for 1965-70. Estimates under the present study (1) and (3) which take account of rural-urban productivity differential, indicate that the average urban per capita income for 1955-60 was lower than that for 1949-55 and then increased to a level above that of the latter period during 1960-65. However, for 1965-70, the trend is again declining according to the present study(1) while results under present study (2) reveal a continued upward trend. Since assumptions underlying estimates under present study(1) appear more reasonable than others these should be accepted for both rural and urban income per capita. On the basis of this it is found that per capita rural income as a percentage of per capita urban income declines from 20% in 1949/50 to 17% in 1963/64, the corresponding figures in Bose being

44% and 37%.[1] However, for the remaining years in the 60's the present study reveals an upward movement in the percentage mentioned above as the figure moves to 22% in 1969/70. The general conclusion one can derive is that, rural-urban income disparity widened during the 50's and early 60's but the trend was slightly reversed in the late 60's. While the trend of the first period can be explained by transfer of income from rural to urban areas as discussed in [12], the recovery of the second period may be attributed to a growth in non-agricultural activities in rural areas, mainly in the form of rural works programme and also to the introduction of HYV technology in agriculture.

The above analysis was based on time series data on national income which included personal, corporate and government income. An alternative set of data is available from national sample surveys and quarterly surveys conducted by C. S. O. These data relate to per capita personal income of the rural and urban population collected from separate sample of households in the two areas over the cross-section of income groups by size. Data in current prices are presented in Appendix Table I and those in constant 1966 prices are presented in Table III. Figures in Table III can be used as alternative evidence on the movement of the real income of the rural and urban population in Bangladesh.[2] Ignoring year to year fluctuations, it seems there was a decline in per capita real income between early 60's and 1966/67, after which there was some recovery but the level

---

[1] Bergan's estimate for personal income in 1963/64 was 60%. The following figures are available for countries in South and Southern Asia.

Country (Year)	**Rural income as % of urban income**
India (1961/62)	57
Indonesia (1964/65) (excluding Jakarta)	73
Philippines (1965)	40
Sri Lanka (1963)	53
Thailand (1962)	53

Source : [57, p. 463].

[2] A number of weaknesses of the sample surveys referred to above are discussed in Bergan [10, pp. 161-163] and Bose [12, pp. 453-454]. In particular, one should be aware of the limitations of the survey data for intertemporal comparisons. Bergan correctly points out the deficiency in the concept of personal income used in the quarterly surveys [10, pp. 163-167]. Since the emphasis in the present study is placed more on the trend rather than on the magnitude of personal income and inequality of income distribution, no attempt was made to correct the C. S. O. figures along the lines suggested by Bergan. In anv case, it was not possible to follow precisely Bergan's methodology because the original returns of the surveys could not be obtained.

observed for 1968 69 (Tk. 370) remained below the level of all years prior to January-June 1965 when the two were equal. On the other hand, for urban areas it is found that the real personal income increased from Tk. 505 in 1963/64 to Tk. 516 in 1968/69 with some fluctuations in between. Given limitations of the figures for personal income, one can only state that there was no significant trend in the disparity of real personal income per capita between the rural and urban areas as indicated by the C. S. O. survey data.

TABLE III

MOVEMENT OF REAL PERSONAL INCOME PER CAPITA IN RURAL AND URBAN AREAS OF BANGLADESH AS INDICATED BY C. S. O. SURVEY DATA

(Taka/1966 prices)

Year	Annual Real Income Per Capita[1]	
	Rural	Urban
1959	384	n.a.
1960	400	n.a.
1961	429	n.a.
1963/64	394	505
Jan.-June 1965	370	523
April-June 1966	n.a.	480
1966/67	346	499
1968/69	370	516

[1] Corresponding figures in Appendix Table I deflated by consumer price index for rural area and for industrial workers at Narayanganj as obtained from Tables IV and V.

B. Movement of Wages of Agricultural and Unskilled Urban Labourers

From the above it is clear that there has not been any appreciable change in the real income per capita of the agricultural, rural and urban populations of Bangladesh over the period 1949 50 to 1969/70. However, national, regional or sectoral averages hide many important facts. For example, in this instance one can only conclude that given the weight of the population below the poverty level in the total population in both rural and urban areas, the trend in overall figures indicates a similar trend for this group also. Further evidence is necessary if one wants to say anything more on the trend of the real income of different groups of people by size of income and by area. Quarterly survey data, as discussed earlier, is rather limited for analysing the long term changes in real income.

From the point of view of policy making regarding income growth and distribution, it is important to study the trend of real income of the poor. Bose did this for the rural poor over the period 1949/50 to 1966/67. He identifies, and quite rightly so, the agricultural labourers as the poorest of the poor in the rural areas. This group, receives bulk of the income from wage labour. Data from quarterly surveys of the C. S. O. and the survey conducted by Rajshahi University, which is quoted by Bose, indicate that in the lowest income group containing the agricultural labourers, wage earnings contribute about 50% of the total income. However, as Bose pointed out, this figure appears to be low for Bangladesh.[1] Nevertheless, the trend in the real wage of agricultural labourers will reflect the trend in their living condition.

A similar exercise is carried out here for the urban poor. The urban poor, like its counterpart in rural areas, is identified as the casual unskilled labourer in various occupations. However, compared with the agricultural labourer, an even larger proportion of its total income is derived from wages and salaries. No hard data on the proportion of unskilled casual labour in the total urban labour force are available. Whatever scattered evidence can be found [18] indicates that this figure is about 50%.

A few points should be noted here. First, available evidence from survey data indicates that there has not been any significant change over time in the proportion of income received from wage labour by the poorest stratum of the population. Second, it is assumed here that there has not been change in the number of full man-days of employment available during a year. This assumption may be somewhat misleading since during the middle and late 60's some additional employment is said to have been generated in Bangladesh through rural works

---

[1] As a supporting evidence Bose quotes some figures for India from a study by Rao; "For all such families with or without land, sampling enquiries made in India indicate the agricultural wages accounted for 64 percent and 73 percent of income in 1950/51 and 1956/57 respectively and non-agricultural wage earnings were respectively 12 and 8 percent of income in those years" [12, p. 461].

programme [12]. Third, Bose assumed that dependency ratio per labourer remained unchanged since 1949; but the figures presented in Appendix Table VIII indicate that there was a decline in this ratio in rural areas between 1959 and 1968/69 while for urban areas the ratio remained more or less the same.[1] Therefore, the actual decline in the standard of living of the rural poor may be somewhat less than what is indicated by the movement of real wage earnings.

As mentioned in Section I, two sets of wage data are used here for both agricultural and urban labour. Nature and quality of data on wage of agricultural labourers reported by the Directorate of Agriculture are discussed in Bose's study [12, pp. 461-462]. The alternative set collected by the Bureau of Statistics appears to be less representative than the above for the period upto liberation since it covered only a few centres in Bangladesh while the Directorate of Agriculture reported wage data by districts which in turn were obtained by taking simple averages of wage rates collected in subdivisions. At the subdivision level nothing is clearly known about the selection of the sample. The data from the Bureau of Statistics refer to unskilled agricultural labourers while the Directorate of Agriculture does not indicate the skill level of the labourers for which data are usually reported. However, it appears that they also correspond to the unskilled agricultural labourers. What is important to note here is that the sample size on the basis of which wage data are collected may be relatively small for making any generalization of the findings. In particular, intra regional variations in wage rates as well as the number of days employed are likely to be quite important in many districts and subdivisions as indicated in some studies in India by Jose [39] and Bardhan[7].

The wage data for unskilled urban labourers in construction work and elsewhere as reported by the Bureau of Statistics can be subjected to the same criticisms as those leveled against data on wages of agricultural labourers. In this case one

---

[1] If one considers the fact that the ratio of infants and children to adults increased since, 1951, then the dependency ratio in terms of adult equivalent would have shown further decline in the case of rural areas and some decline in the case of urban areas. In Bangladesh according to the two censuses (1951 and 1961) and C. S. O. survey of population and labour force [28], percentage of population under age 15 were as follows.

Census 1951	42.1
Census 1961	46.1
C. S. O. January and September 1965	48.0
C. S. O. 1966/67	48.3

further point should be borne in mind. While the wage of helpers in construction work is determined by pure market forces, the same is not true of the wage of unskilled workers which include industrial workers. Unlike the agricultural labourers and helpers in construction work, industrial workers (skilled or unskilled) are an organised group and can bring about trade union pressure on the management to effect upward revision of wages. Besides they also get the benefit of the minimum wage legislation while the others do not since there is no mechanism to enforce it for them.

For agricultural labour, Bose's series on wage earnings was extended upto 1973 following the same methodology as used by him. The data reported by the Bureau of Statistics were also compiled in a similar manner. For unskilled urban labourers the total number of days employed during a year was assumed to be 300, a figure somewhat above the level for rural areas (259 days).[1] Clearly, this was an arbitrary upward revision since no hard data on the supply and demand for unskilled urban labour are available. With these observations one can now turn to analyse the trend of real wage earnings of agricultural labourers and unskilled urban workers.

From Appendix Tables II and IV one can see that agricultural wage rates (nominal) as reported by the Directorate of Agriculture are slightly lower than those reported by the Bureau of Statistics for the period 1962-68 but after 1968 the former is higher than the latter. However, for the years covered by both, the wage rates reveal a similar trend. As observed by Bose, starting from 1949 money wage rates declined during the 50's with a recovery trend in the late 50's and the 1949 level was surpassed only in 1960. With some minor fluctuations, money wage rates increased throughout the 60's and in the 70's. Clearly, the post-liberation Bangladesh has witnessed a relatively sharper money wage increase compared with any period in the pre-March 1971 Pakistan.

In order to obtain real wage earnings of the agricultural labourers, money wage earnings were deflated by the consumer price index for agricultural labourers. Bose constructed such an index for the period 1949-66 [12] and later extended it

---

[1] This figure can be looked at as allowing for 1 day off in a week and an extra 9 days off in a year due to sickness and festivities.

to 1973 [13]. In this study the following departures were made from Bose in constructing a new consumer price index for the period 1967-73. Bose assumed no price change for certain food and non-food items[1] but in this study price changes for the years 1967-73 as reported in the sources of data were incorporated. For the group including milk, fish, beef, mutton and eggs, fish was taken here as the representative item. In the case of certain groups the representative item taken here is different from that of Bose. For example, in the case of clothing, longcloth instead of sari was taken as the representative item. Similarly, for fruits and vegetables, banana instead of onions was taken as the representative item. In spite of these differences it is unlikely that the use of extended consumer price index for the period 1967-73 will introduce any significant bias in the estimate of real wage earnings, in particular in revealing their trend over time.[2]

Annual real wage earnings of agricultural labourers along with indices are presented in Table IV. They are also shown diagramatically in Figure 1. The series based on wage data collected by the Directorate of Agriculture indicates that like the nominal wage earnings, real wage earnings were lower in 50's compared with 1959 and it was only in 1961 that the real wage index turned out to be slightly above the level of 1949. In all years between 1961 and 1968, the real wage earnings were below the level of 1961 except in 1963 and 1964. One can identify two relatively short periods (1961-64 and 1965-69)[3] in the 60's when an upward movement in real wage earnings could be discerned. However, following 1969 there was a very

---

[1] Wheat, pulses, milk, fish, beef, mutton, chicken, eggs, *pan*, betelnuts and other non-food items.

[2] Two further shortcomings of the consumer price index for agricultural labourers should be pointed out here. First, the basic price data refer to retail prices in selected urban centres of Bangladesh, while one should have used a weighted average of farm yard price and retail price at secondary rural market, weights being the proportion of cash purchased and home produced consumption. Such data were not available for the entire period under study. Master Survey of Agriculture by the Bangladesh Bureau of Statistics [22] provided data for only a few years in the 60's on the price spread between farm yard and secondary markets in rural areas. Second, one should use group specific prices while constructing indices. It is observed that because of differences in representative items as well as quality of the item, prices paid by one income group differ from those paid by other income groups and more important the relative rates of price changes are different for different income groups. Bardhan [6; 8] and Iyengar and Bhattacharya [38] have emphasized the need for income group specific price indices.

[3] An upward movement in real wage earnings during 1961-64 can be attributed to larger public investment in agriculture as compared with earlier years and also to the relatively good harvests of rice [18]. A similar movement during 1965-69 may be due to the impact of expenditure on rural works programme [30] and due to the stability of foodgrains prices, which was maintained through substantial import of foodgrains under PL-480. The latter had stabilising and somewhat depressing effect on the consumer price index as can be seen from Table IV.

TABLE IV

ANNUAL WAGE EARNINGS OF AGRICULTURAL LABOURERS IN BANGLADESH

(Taka)

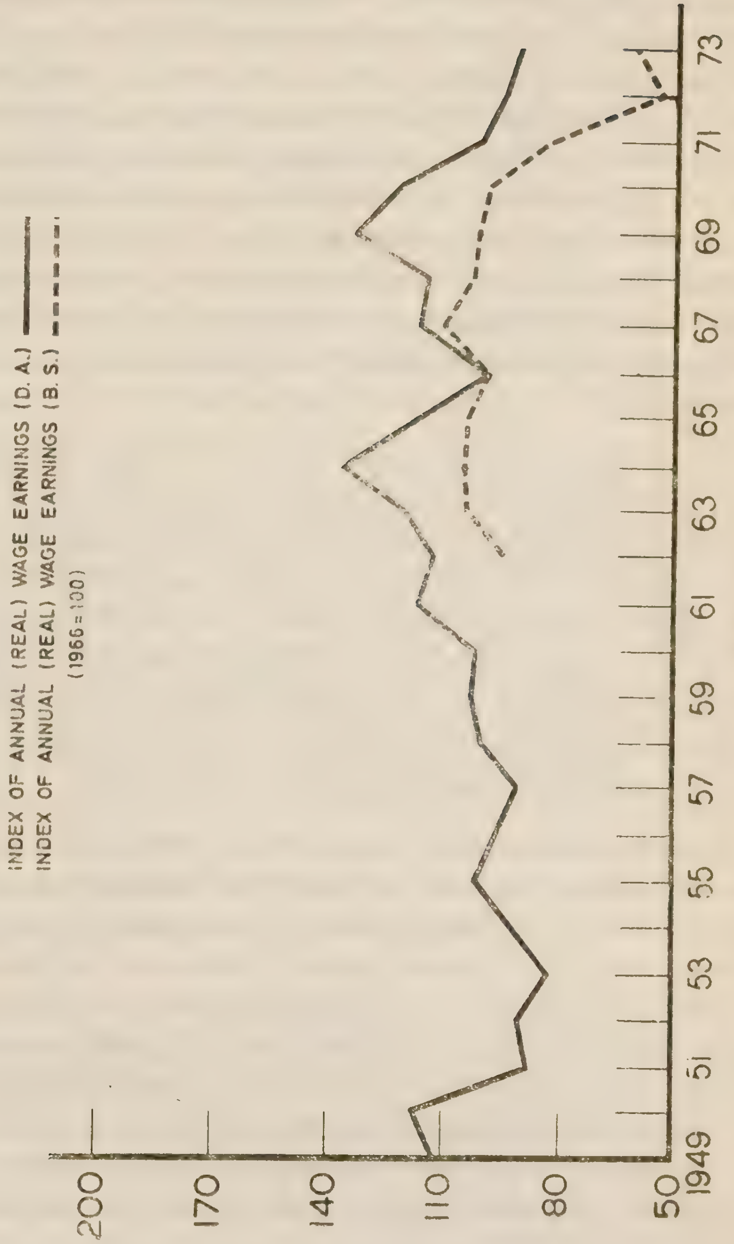
Year	Annual Nominal Wage Earnings		Consumer Price Index (1966=100)	Annual (real) Wage Earnings			
	D. A.	B. S.		D.A.	Index	B. S.	Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1949	497	—not available—	71·3	697	112·1	—not available—	
1950	419		63·1	666	107·1		
1951	402		73·3	549	88·4		
1952	396		70·5	562	90·5		
1953	357		69·6	513	82·5		
1954	n.a.		57·6	n.a.	n.a.		
1955	339		53·7	635	102·3		
1956	n.a.		71·5	n.a.	n.a.		
1957	441		77·6	567	91·3		
1958	480		75·9	632	101·7		
1959	478		74·7	642	103·3		
1960	506		79·5	635	102·1		
1961	564		76·9	733	117·9		
1962	581	572	82·4	704	113·4	694	95·3
1963	624	635	82·5	756	121·7	770	105·8
1964	687	624	80·5	852	137·1	776	106·6
1965	606	640	83·5	723	116·2	766	105·2
1966	621	728	100·0	621	100·0	728	100·0
1967	671	751	92·4	726	116·9	813	111·7
1968	712	774	100·1	711	114·5	773	106·2
1969	808	746	96·9	834	134·3	770	105·8
1970	777	769	102·2	760	122·4	752	103·3
1971	816	793	129·6	630	101·5	612	84·1
1972	1020	668	170·8	597	96·1	391	53·7
1973	1450	1119	250·0	580	93·4	448	61·5

Sources: 1. Col. 1. 1949-66—Bose, S. R. [12, p. 467].
1967-73—Appendix Table II.

2. Col. 2. Appendix Table IV.

3. Col. 3. 1949-66—Bose, S. R. [12, p. 467].
1967-73—Appendix Table VI.

4. Col. 4 and 6. Figures in Col. 1 and 2 deflated by consumer price index in Col. 3.



INDEX OF REAL WAGE EARNINGS OF AGRICULTURAL LABOURERS IN BANGLADESH

FIG. - I

sharply declining trend in real wage earnings. This happened in spite of the fact observed earlier, that money wage earnings increased significantly during this period. The real wage index for 1973,according to the Directorate of Agriculture wage series, stood at 93.40 as compared with 134.30 in 1969, 102.1 in 1960 and 112.1 in 1949. A similar trend is observed in the wage data collected by the Bureau of Statistics. Therefore, one reaches the inevitable conclusion that with the exception of few years in the 60's,an average agricultural labour household was poorer in all years between 1950 and 1973 than in 1949. The extent of decline in the real wage earnings has been very noticeable in the post-liberation Bangladesh. However, this finding should be qualified to take account of the fact that there is some evidence of dependency ratio per agricultural labourers declining in the late 60's.

What is important to note here is that the HYV technology introduced in the 60's did not have any appreciable impact on the real wages of agricultural labourers. Although the two short periods of rising real wages mentioned above may be related to HYV technology i. e., fertilizer and pesticide in the early 60's and fertilizer, pesticide and improved seeds in the late 60's and early 70's, yet clearly such rising trends were not sustained. In fact real wages seem to have started declining during the period following 1969 when considerably greater emphasis was placed on HYV technology. This finding is similar to the one observed by Bardhan [7] for the Punjab and Hariana in India.

Wage data on urban labour are available for 1958-73 in the case of helpers in construction and for 1962-73 in the case of all unskilled workers. The basic data are collected by the Bureau of Statistics. Unfortunately, in the relevant publications nothing is said about the method of collection of the primary data and hence nothing meaningful can be said on the quality of data except what has already been observed regarding the smallness of the sample used by the Bureau. Nominal wage rates, earnings and indices are presented in Appendix Table V. It is found that money wage earnings of the unskilled urban labourers were higher in the late 60's as compared with those in the early 60's and late 50's. However, no significant rising trend in money wages is discernible until the 70's.[1]

---

[1] It may be mentioned here that, relatively speaking wage rate of all unskilled workers reveals a more systematic upward trend throughout the entire period. This appears quite consistent with what was observed above about the method of wage determination for unskilled labour in construction work and unskilled labour in other industries in the urban areas.

For urban labourers, real wage earnings were derived by deflating the money wage earnings by the consumer price index of industrial workers at Narayanganj. Clearly, the use of this index was not quite appropriate since the consumption basket (and weights associated with it) of the Narayanganj industrial workers may be different from that of average unskilled labour household in Bangladesh. In particular, regional variation in prices and their trends have not been incorporated at all. However, in the absence of necessary data, a more appropriate consumer price index could not be constructed. Data on consumer price index, real wage earnings and their indices are presented in Table V. The indices of real wage are also shown diagramatically in Figure 2. The real wage earning of helpers in construction work reached its peak in 1964. However, during the period 1962-68, the real wage earning fluctuated moderately around this peak. The levels of real wage earning during 1958-61 and 1969-73 were much below those of 1962-68. In particular, in the 70's there was a very sharp decline in real wage earning of this group of workers. To be more precise, the index of real wage earning in 1973 was 53.20 as compared with 116.28 in 1964. Comparable decline in real wage earning is also observed in the post-liberation Bangladesh in the case of all unskilled workers. However, as expected, during the entire 60's, the real wage earning of all unskilled workers were stable around the level of 1966. It seems that although this group did not improve its position in terms of real wage earning during the 60's, it was able to effect a more spontaneous wage price adjustment than all other groups of labourers considered here. The general conclusion that can be drawn from the above is that the living condition of the unskilled urban labourers remained stable during the 60's but deteriorated significantly during the 70's particularly in the post-liberation Bangladesh.

It may be of some interest to analyse the trend in the relative wage (real) rates of rural and urban labourers in Bangladesh. Since two sets of figures were available for each,four measures of relative wages were calculated in Table VI. It is found that in all cases the relative wage is less than unity except in 1972 and 1973 with rural wages taken from the evidence collected by the Directorate of Agriculture. If one considers the period following 1962, which is covered by all four measures of relative wage, it seems there is a slight upward trend in the relative wage. This can be seen clearly from the averages shown in the parentheses in Table VI. This can be attributed to an increased demand for labour in the

TABLE V

ANNUAL WAGE EARNINGS OF UNSKILLED URBAN LABOURERS

(Taka)

Year	Nominal Wage		Consumer Price Index[3]	Real Wage		Index of Real Wage	
	Helper in Construction	All Unskilled Workers		Helper in Construction	All Unskilled Workers	Helper in Construction (1966=100)	All Unskilled Workers (1966=100)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1958	633	n. a.	75.89	834	n. a.	80.81	n. a.
1959	669	n. a.	79.30	844	n. a.	81.78	n. a.
1960	756	n. a.	79.82	947	n. a.	91.76	n. a.
1961	816	n. a.	83.74	974	n. a.	94.38	n. a.
1962	900	753	85.01	1059	886	102.62	96.20
1963	999	834	86.52	1155	964	111.92	104.67
1964	1083	879	90.26	1200	974	116.28	105.75
1965	1017	885	91.07	1117	972	108.24	105.54
1966	1032	921	100.00	1032	921	100.00	100.00
1967	1032	942	101.41	1018	929	98.64	100.87
1968	1122	1008	106.61	1052	945	101.94	102.61
1969	1053	1077	109.89	958	980	92.83	106.41
1970	1119	1080	112.38	996	961	96.51	104.34
1971	1107	1230	139.29[1]	795	883	77.03	95.87
1972	1236	1230	225.59	548	545	53.10	59.17
1973	1584	1464	288.77[2]	549	507	53.20	55.05

Notes :
1. Jan.-Feb.
2. July-Dec.
3. For industrial workers at Narayanganj, Base Year for the construction of indices changed over time. All were changed to 1966 base. The coverage of commodities also seems to have changed.

Sources:
1. Col. 1 and 2. Appendix Table V.
2. Col. 3. [16; 24; 25].
3. Col. 4 and 5. Figures in Col. 1 and 2 deflated by consumer price index as given in Col. 3.

INDEX OF REAL WAGE OF UNSKILLED URBAN LABOURERS IN BANGLADESH

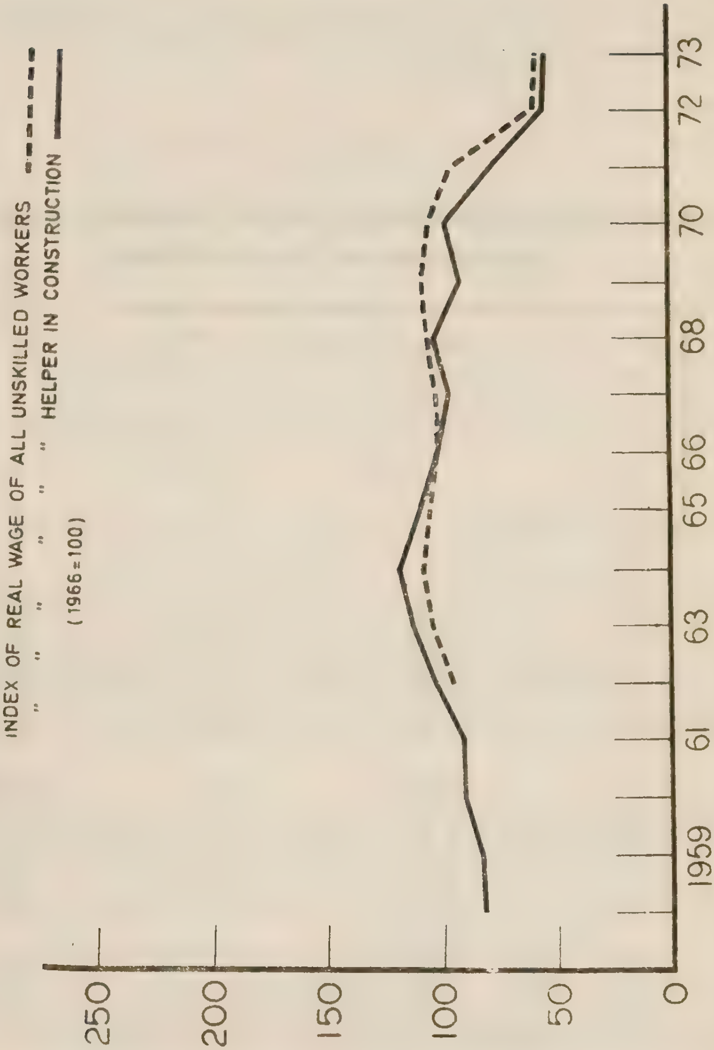


FIG.-2

rural areas during late 60's due to works programme and HYV technology and also due to rural-urban migration of labour which is said to have started in the middle 60's and has continued until today. Although no hard data are available, it is observed by many that in the post-liberation Bangladesh there has been a very substantial influx of migrant labour into urban areas.

TABLE VI

TREND IN THE RELATIVE WAGE (REAL) OF RURAL AND URBAN LABOURERS IN BANGLADESH

Year	Rural Wage / Urban Wage							
	1		2		3		4	
1958	0.76	(0.74)						
1959	0.76							
1960	0.67							
1961	0.75							
1962	0.66	(0.65)	0.78	(0.79)	0.79	(0.77)	0.66	(0.68)
1963	0.65		0.80		0.78		0.67	
1964	0.71		0.80		0.87		0.65	
1965	0.65		0.79		0.74		0.69	
1966	0.60		0.79		0.67		0.71	
1967	0.71	(0.76)	0.88	(0.79)	0.78	(0.78)	0.80	(0.77)
1968	0.68		0.82		0.75		0.74	
1969	0.87		0.79		0.85		0.80	
1970	0.76		0.78		0.79		0.76	
1971	0.79		0.69		0.71		0.77	
1972	1.09	(1.07)	0.71	(0.80)	1.10	(1.12)	0.71	(0.77)
1973	1.05		0.88		1.14		0.82	

Notes:

1. = Rural Wage (D. A.)/urban wage of helper in construction.

2. = Rural Wage (B. S.)/urban wage of all unskilled workers.

3. = Rural wage (D. A.)/urban wage of all unskilled workers.

4. = Rural wage (B. S.)/urban wage of helper in construction.

Sources: Tables IV and V.

III. CHANGES IN THE PATTERN OF PERSONAL INCOME DISTRIBUTION BY SIZE IN BANGLADESH

A. Measurement of Income Inequality and its Movement Over Time

Movement of the real income per capita of the rural and urban poor is related to the pattern of income distribution and its changes over time. Total income remaining the same, a more unequal distribution will indicate a worsening of the living conditions of the lower income group. On the other hand, an improvement in the distribution of income (in the sense of reduction in inequality) may be consistent with a decline in the real income of the poor, if no substantial improvement in the mean income of the total population takes place and also if the redistribution takes place only among the groups of people below the average income level. Such an outcome is also possible if the relative rates of change in prices is different for different income groups.[1]

As mentioned before, data on personal income distribution by size were obtained from sample surveys conducted by C. S. O. in the rural and urban areas of Bangladesh at different points of time. However, the first three national sample surveys covered rural areas only and the size of the sample in each of these surveys was smaller than that of quarterly surveys which were started beginning 1963/64.[2] While intertemporal and interregional comparison of income inequality is affected

---

[1] Bardhan [6, p. 246] has shown that in India between 1954/55 and 1964/65, the average price of cereals paid by bottom 10% of the rural population has increased faster than that paid by top 10%.

[2] Distribution of sample households in different surveys can be seen from the following table.

	1959	1960	1961	1963/64	Jan.-June 1965	April-June 1966	1966/67	1968/69
Rural	1600	1861	1977	2952	n. a.	n. a.	4698	4823
Urban				1347	n. a.	n. a.	1288	1385
Total	1600	1861	1977	4299	n. a.	n. a.	5977	6208

n. a. indicates not available. In these cases while the number selected for sample is available, nothing could be found about the actual sample i. e., the number of schedules returned and accepted after preliminary scrutiny. It should be noted here that some problems of comparison may arise due to the fact that while the national sample surveys covered calendar year, the quarterly surveys covered either full fiscal year or a part thereof.

by the differences in sample size, there are two other problems in making such comparisons. First, when comparisons are made over time, persons comprising a particular group do not remain the same. Second, when the revealed pattern of income distribution is studied on the basis of household income survey, account is not taken of the fact that within the same income group, different households represent different stages of their life-cycle.[1]

One further problem may arise in the study due to the use of the concept of personal income as defined in the C. S. O. surveys. C. S. O. included certain items (e. g., borrowing, sale of property and savings withdrawls) in its definition of household income. Bergan used original returns for 1963/64 to make deductions for these items. Since it was not possible to have access to the original returns of all surveys conducted by C. S. O., no attempt was made in this study to make such corrections to their estimate of personal income. However,a comparison of the results of Bergan's study with those of the present study for 1963/64 reveals that no significant bias is introduced in measuring income inequality on account of the factor mentioned above. Furthermore, unless the weight of the items mentioned above in the total income of different groups by size changed significantly over time, the revealed trend in inequality is unlikely to be affected much. What is really of some significance is that, one would now have to be cautious while comparing the results of this study with those of others. In any case a number of problems will remain in comparing the pattern of income distribution over time, across nations or regions.[2]

Basic data on personal income distribution in Bangladesh along with income shares of ordinal groups in different years for rural, urban and combined areas (depending, of course, on the availability of data) are presented in Tables VII through XIV. A summarised version of the data for all years on the size distribution of income in Bangladesh and also two types of index of inequality are calculated and are shown in Table XV. These indices are, the well known concentration ratio (CR) or Gini coefficient and the index of decile inequality. The former is estimated from the Lorenz curve as the ratio of the area between the actual

---

[1] For a discussion on these and similar other points see Sundrum [57].

[2] In terms of welfare implication, one problem in such comparisons arises, due to differences in family size, prices, age, consumption patterns and other personal circumstances.

TABLE VII

PERSONAL INCOME DISTRIBUTION IN BANGLADESH, 1959

(RURAL AREAS ONLY)

Annual Household Income Group (Taka)	% of Household (1)	Cumulated % of Household (2)	Share of Monthly Income (3)
All Groups			
300 or less	1	1	0.1
301 — 600	13	14	3.9
601 — 1,000	24	38	15.6
1001 — 2,000	41	79	50.8
2001 — 3,000	11	90	66.4
3001 — 4,000	5	95	76.9
4001 — 6,000	3	98	87.1
Over 6,000	2	100	100.0

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Rural	1.3%	3.0%	6.8%	11.7%	17.3%	25.9%	34.5%	43.0%	52.2%	66.4%	76.9%	100%

Source : [26].

TABLE VIII

PERSONAL INCOME DISTRIBUTION IN BANGLADESH, 1960

(RURAL AREAS ONLY)

Monthly Household Income Groups (Taka)	Cumulated % of Household (1)	Cumulated % of Population (2)	Share of Monthly Income (3)
Less than 50	12.8	6.6	2.5
50 — 99	49.9	35.9	23.9
100 — 149	73.4	60.1	46.1
150 — 199	84.3	74.3	60.7
200 — 249	90.0	81.9	70.6
250 — 299	93.2	87.0	77.4
300 — 399	96.5	92.4	86.4
400 — Over	100.0	100.0	100.0

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Rural	1.0%	2.0%	6.7%	12.4%	15.7%	24.0%	33.4%	42.9%	54.9%	70.6%	82.3%	100.0%

Source: [26].

TABLE IX

PERSONAL INCOME DISTRIBUTION IN BANGLADESH, 1961

(RURAL AREAS ONLY)

Monthly Household Income Groups (Taka)	Cumulated % of Household	Cumulated % of Population	Share of Monthly Income
	(1)	(2)	(3)
Less than 50	10.4	4.8	2.6
50 — 99	40.9	27.4	17.1
100 — 149	65.3	51.3	36.8
150 — 199	79.3	67.0	52.7
200 — 249	85.3	75.6	61.4
250 — 299	90.0	82.0	69.8
300 — 399	94.9	89.7	80.2
400 — Over	100.0	100.0	100.0

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Rural	1.3%	2.5%	7.2%	11.9%	16.7%	24.4%	32.5%	42.1%	53.7%	69.8%	80.6%	100.0%

Source: [26].

TABLE X

PERSONAL INCOME DISTRIBUTION IN BANGLADESH, 1963/64

Monthly Household Income Groups (Taka)	Cumulated % of Household			Cumulated % of Population			Share of Monthly Income		
	Rural	Urban	Combined	Rural	Urban	Combined	Rural	Urban	Combined
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Less than 50	7.3	4.5	6.4	3.3	1.8	2.8	1.9	0.8	1.5
50 — 99	38.1	26.5	34.5	27.1	16.8	23.7	18.0	8.8	14.4
100 — 149	65.0	52.9	61.3	53.2	40.4	49.0	40.3	24.3	34.0
150 — 199	80.8	67.0	76.6	70.9	54.8	65.6	58.9	35.8	49.8
200 — 249	89.2	76.2	85.2	81.2	65.8	76.1	71.5	45.5	61.2
250 — 299	93.7	82.1	90.2	87.7	73.6	83.0	79.8	53.3	69.3
300 — 399	96.9	88.2	94.3	93.2	82.0	89.4	87.3	63.2	77.7
400 — 499	98.4	92.7	96.7	96.5	88.0	93.5	92.0	72.6	84.2
500 — 699	99.4	96.2	98.5	98.7	93.4	96.7	95.8	82.2	90.3
700 — 899	99.7	98.1	99.3	99.4	96.6	98.2	97.3	89.3	94.0
900 — Above	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Rural	1.3%	3.3%	8.5%	13.8%	19.6%	27.9%	36.2%	46.2%	58.0%	73.0%	82.8%	100.0%
Urban	1.0%	2.8%	6.4%	10.9%	16.7%	22.6%	30.1%	39.0%	50.5%	67.0%	78.9%	100.0%
Combined	1.2%	3.2%	7.7%	12.3%	18.4%	25.7%	33.0%	43.7%	54.3%	69.0%	79.6%	100.0%

Source : [27].

TABLE XI

PERSONAL INCOME DISTRIBUTION IN BANGLADESH: JANUARY-JUNE, 1965

Monthly Household Income Groups (Taka)	Cumulated % of Households		Cumulated % of Population		Cumulated % of Monthly Income	
	Rural	Urban	Rural	Urban	Rural	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
Less than 50	6.0	2.4	2.8	0.7	1.6	0.4
50— 99	39.5	23.1	27.4	14.3	19.1	7.5
100— 149	67.0	43.1	54.2	31.1	41.7	18.4
150— 199	80.8	60.5	70.1	48.1	57.9	31.4
200— 249	88.6	71.9	80.4	60.8	69.5	42.4
250— 299	92.9	79.5	86.6	70.2	77.5	51.4
300— 399	97.1	88.7	93.5	83.2	87.1	65.4
400— 499	97.9	92.7	95.1	89.1	89.7	73.6
500— 749	99.5	96.9	98.5	95.0	96.0	84.9
750— 999	99.8	98.7	99.3	97.8	97.8	91.7
1000—1499	99.9	99.5	99.6	99.0	98.4	95.7
1500—1999	100.0	99.7	99.9	99.3	99.3	96.9
2000—above		100.0	100.0	100.0	100.0	100.0

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Rural	1.3%	3.7%	8.9%	14.1%	19.5%	27.7%	35.9%	45.2%	57.0%	72.1%	82.3%	100.0%
Urban	1.3%	3.0%	6.4%	11.3%	16.7%	23.6%	31.0%	40.6%	52.2%	68.1%	79.8%	100.0%

Source : [27].

TABLE XII

PERSONAL INCOME DISTRIBUTION IN BANGLADESH : APRIL-JUNE, 1966

(URBAN AREAS ONLY)

Monthly Household Income Groups (Taka)	Cumulated % of Household (1)	Cumulated % of Population (2)	Cumulated % of Monthly Income (3)
Less than 50	1.2	0.7	0.2
50 — 99	23.9	15.5	8.7
100 — 149	49.8	37.7	23.7
150 — 199	65.7	53.4	36.7
200 — 249	75.4	64.3	46.8
250 — 299	82.3	73.4	55.4
300 — 399	87.9	81.9	64.2
400 — 499	92.9	89.2	74.9
500 — 749	97.9	95.8	88.8
750 — 999	98.8	97.9	92.5
1000 — 1499	99.7	99.2	97.6
1500 — 1999	100.0	100.0	100.0
2000 — above			

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Urban	1.6%	3.5%	7.2%	12.2%	18.0%	23.9%	32.0%	41.2%	52.5%	68.7%	80.7%	100.0%

Source : [27].

TABLE XIII

PERSONAL INCOME DISTRIBUTION IN BANGLADESH, 1966/67

Monthly Household Income Groups (Taka)	Cumulated % of Households			Cumulated % of Population			Cumulated % of Monthly Income		
	Rural	Urban	Combined	Rural	Urban	Combined	Rural	Urban	Combined
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Less than 50	2.8	0.9	2.4	1.3	0.4	1.1	0.8	0.2	0.6
50 — 99	37.8	19.1	33.8	27.3	12.6	24.8	18.7	6.8	15.1
100 — 149	63.7	46.3	60.0	51.2	34.9	48.3	39.8	21.7	34.2
150 — 199	79.3	62.9	75.8	68.7	50.4	65.4	57.6	34.4	50.4
200 — 249	88.2	73.6	85.1	80.2	62.7	77.1	70.7	45.0	62.6
250 — 299	93.3	80.8	90.7	87.5	71.7	84.7	79.9	53.7	71.6
300 — 399	97.0	89.5	95.5	93.6	83.3	92.1	88.4	66.8	81.4
400 — 499	98.4	93.5	97.5	96.2	89.4	95.5	92.4	74.7	86.5
500 — 799	99.6	97.0	99.2	98.8	94.5	98.6	97.3	83.5	92.5
750 — 999	99.8	98.2	99.6	99.4	96.7	99.5	98.5	88.3	94.7
1000 — 1499	100.0	99.5	100.0	100.0	99.0	100.0	100.0	95.0	97.7
1500 — 1999		99.8			99.6			97.3	98.4
2000 — Above		100.0			100.0			100.0	100.0

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Rural	2.4%	4.5%	9.6%	14.7%	20.5%	28.6%	36.8%	47.0%	58.6%	73.9%	83.8%	100.0%
Urban	1.7%	3.5%	7.3%	12.8%	18.2%	24.5%	32.2%	41.4%	52.7%	67.8%	78.5%	100.0%
Combined	1.8%	4.1%	8.7%	13.3%	19.6%	26.9%	34.2%	44.5%	55.9%	70.5%	80.4%	100.0%

Source : [27].

TABLE XIV

PERSONAL INCOME DISTRIBUTION IN BANGLADESH, 1968/69

Monthly Household Income Groups (Taka)	Cumulated % of Households			Cumulated % of Population			Cumulated % of Monthly Income		
	Rural	Urban	Combined	Rural	Urban	Combined	Rural	Urban	Combined
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Less than 50	1.7	0.3	1.4	0.7	0.1	0.5	0.5	0.4	0.3
50 — 99	31.7	12.4	27.4	22.4	7.3	18.8	16.7	4.3	12.9
100 — 149	61.5	38.0	56.3	50.0	27.1	44.5	41.5	17.7	34.8
150 — 199	80.5	59.2	75.7	71.3	47.1	65.5	63.6	33.1	53.8
200 — 249	90.2	72.8	86.3	84.0	62.4	78.8	78.2	45.8	67.8
250 — 299	95.0	81.0	91.8	90.9	72.5	86.4	86.9	55.2	76.8
300 — 399	98.5	88.9	96.3	96.8	83.2	93.5	94.9	66.5	85.9
400 — 499	99.4	93.0	97.9	98.4	88.8	96.1	97.4	74.3	90.1
500 — 749	99.8	96.8	99.1	99.6	94.5	98.4	99.3	84.0	94.7
750 — 999	99.9	98.4	99.5	99.8	97.2	99.2	99.7	89.8	96.8
1000 — 1499	100.0	99.5	99.8	100.0	99.3	99.8	100.0	95.2	99.0
1500 — 1999		99.9	99.9		99.7	99.9		97.8	99.7
2000 — Above		100.0	100.0		100.0	100.0		100.0	100.0

Shares of Ordinal Groups of Households

	Bottom 5%	Bottom 10%	Bottom 20%	Bottom 30%	Bottom 40%	Bottom 50%	Bottom 60%	Bottom 70%	Bottom 80%	Bottom 90%	Bottom 95%	Bottom 100%
Rural	2.3%	5.0%	10.4%	15.8%	23.6%	31.9%	40.2%	51.4%	63.0%	74.6%	86.9%	100.0%
Urban	1.7%	3.5%	8.3%	13.5%	19.2%	26.4%	33.8%	43.2%	54.1%	68.6%	79.4%	100.0%
Combined	2.0%	4.5%	9.3%	14.9%	22.4%	30.0%	38.4%	48.2%	59.5%	73.9%	83.3%	100.0%

Source : [27].

income distribution curve and the line of perfect equality to the total area under the latter. In terms of actual calculation, linear approximations of successive segments of the Lorenz curve are taken. Index of decile inequality is calculated as the mean deviation (from 10%) of decile shares divided by 18. Like the CR this index also ranges between 0 and 1. Oshima [45] points out that relative to index of decile inequality the CR tends to overstate inequality. This is because CR gives greater weight to extreme values compared with moderate values in the the income scale while the index of decile inequality gives any unit of deviation in any portion of an income distribution the same weight.[1] In addition, with Lorenz curves there can be the problem of indeterminacy in comparison, which arises when Lorenz curves cross one another thus making it difficult to say anything about the comparative levels of social welfare.[2]

Figures in the tables referred to above, indicate a high degree of inequality in income distribution in the rural, urban and combined areas of Bangladesh in all years for which data were available. For the country as a whole the bottom 5% of the households never received more than 2% of the total income while the share of top 5% was above 15%. Again while the bottom 40% received about one fifth or less of total income, the top 20% always received more than 40%. For rural areas, it is observed that the share of bottom 5% in total income remained stable around 1.3% except in 1966/67 and 1968/69 when it rose slightly above 2%. On the other hand, the share of the top 5% in total income was above 15% in all years except 1968/69 when it was 13.1%. In the case of urban areas, the share of the bottom 5% in total income was always below 2% while the share of the top 5% was around 20% or above. In terms of the share of botom and top 20% of the households in total income, it is found that difference between the rural and urban areas is not significant except perhaps in 1968/69.

---

[1] According to Oshima the index of decile inequality is more useful "...for general purposes, for example, the investigation of the degree of inequality and tracing of the sources and circumstances contributing to the inequality......" [43, p. 11].

[2] This is brought out by Sen [54]. He pointed out further that although CR comparisons are always conclusive, yet the problem remains that the class of welfare function corresponding to CR is highly restrictive.

Clearly, the urban areas exhibit a higher degree of inequality than rural and combined areas.[1] This is corroborated by both indices of inequality as shown in Table XV. As expected the index of inequality for urban areas is greater than that of other areas in all comparable years. It is also found that the index of decile inequality is always smaller than CR. As a matter of fact, the extent of overstatement of the degree of inequality by the CR appears to be quite significant.

As for the changes in the pattern of income distribution, it is observed that in the case of combined rural and urban areas the share of the bottom 5% and also of the bottom 10% registered a systematic increase over time while the share of the top 5% and also of the top 20% declined (Table XV). Clearly, there was no appreciable change in the share of the middle income group. For both the rural and urban areas the trend is similar although for the top 20% in the rural areas it is somewhat irregular. However, it may be pointed out that for the rural areas, the increase in the share of the bottom 5% did not take place until 1966/67, while in the case of the utban areas, the growth in this share was steady but very slow. On the contrary the decline in the share of top 5% was more pronounced in the case of rural areas than urban areas.

The compounded result of the movements of relative shares in different size group of income is that inequality of income distribution declined in the middle and later part of the 60's. This is indicated by both indices of inequality. In fact, the trend revealed by the two indices is indentical for rural and urban areas, while for combined areas, the index of decile inequality reveals the declining trend more clearly than the CR. The reduction in income inequality between 1963/64 and 1968/69 is, however, more pronounced for rural and combined areas than for urban areas. As can be seen from Table VIII, for urban areas the CR (index of decile inequality) has remained stable around 0.38 (0.32). For rural areas the CR (index of decile inequality) decreased from 0.38 (0.31) in 1961 to 0.33 (0.27) in 1963/64 to 0.31 (0.26) in 1966/67 and 0.27 (0.22) in 1968/69. Clearly, the movement in the overall income inequality was influenced primarily by the weight of the rural sector and the change in inequality of income distribution in the rural sector. This follows from the change in the pattern of income distribution in

---

[1] This was also the finding for India (1953/54 to 1956/57) by Ojha and Bhatt [44, p. 714]. Sundrum [57, p. 11] provides a similar evidence for a number of Asian countries.

TABLE XV

SIZE DISTRIBUTION OF INCOME IN BANGLADESH

(Percentage of total personal income in current prices)

Year/Area	Lowest 5%	0—20%	20—40%	40—60%	60—80%	80—100%	Highest 5%	Concentration Ratio (Index of decile inequality)
Rural								
1959	1.3	6.8	10.5	17.2	17.7	47.8	23.1	0.38 (0.31)
1960	1.0	6.7	9.0	17.7	21.5	45.1	17.7	0.38 (0.31)
1961	1.3	7.2	9.5	15.8	21.2	46.3	19.4	0.38 (0.31)
1963/64	1.3	8.5	11.1	16.6	21.8	52.0	17.2	0.33 (0.27)
Jan.-June 1965	1.3	8.9	10.6	16.4	21.1	43.0	17.7	0.33 (0.27)
1966/67	2.4	9.6	10.9	16.3	21.8	41.4	16.2	0.31 (0.26)
1968/69	2.3	10.4	13.2	16.6	22.8	37.0	13.1	0.27 (0.22)
Urban								
1963/64	1.0	6.4	10.3	13.4	20.4	49.5	21.1	0.41 (0.34)
Jan.-June 1965	1.3	6.4	10.3	14.3	21.2	47.8	20.2	0.39 (0.33)
April-June 1966	1.6	7.2	10.8	14.0	20.5	47.5	19.3	0.38 (0.32)
1966/67	1.7	7.3	10.9	14.0	20.5	47.3	21.5	0.38 (0.32)
1968/69	1.7	8.3	10.9	14.6	20.3	45.9	20.6	0.37 (0.30)
Combined								
1963/64	1.2	7.7	10.7	14.6	21.3	45.7	20.4	0.36 (0.30)
1966/67	1.8	8.7	10.9	14.6	21.7	44.1	19.6	0.30 (0.29)
1968/69	2.0	9.3	13.1	16.0	21.1	40.5	16.7	0.30 (0.24)

Sources : Tables VII through XIV.

urban areas, the weight of the urban sector and the fact observed in Section II that there was no significant trend in the intersectoral income inequality (income measured by per capita factor income).[1] It may be of some interest to note that the observed reduction in income inequality took place during a period when time series national income data reveal no significant change in the real income per capita of the rural, urban or combined population (Table II) and survey data reveals, if any thing. a declining trend for the real income of the rural population (Table III).

Keeping in view the limitations mentioned earlier, one can now turn to make some international comparisons of the inequality in income distribution. This is done in Table XVI and XVII. Table XVI compares the CR's for the country as a whole, while Table XVII compares the sectoral CR's. It appears that the average level of income inequality in Bangladesh is less than other countries in Asia except the Republic of Korea. As for trend over time, available evidence indicate a reduction in inequality in Sri Lanka and Bangladesh while in the case of India the inequality seems to have increased.[2] Comparing the sectoral concentration ratios it is observed that Bangladesh comes out favourably (in terms of lesser degree of inequality) in both rural and urban areas. However, for all countries in the sample, the difference between the two sectors in the degree of income inequality appears to be similar.

B. Some Reflections on the Sources of Income Inequality and its Changes Over Time in Bangladesh

A comprehensive analysis of the causes of inequalities and changes in inequalities is outside the scope of this study. However, with the data available nothing much can be done either. In the literature a number of factors have been identified which are said to be contributing to inequality in income distribution and changes in inequalities are also said to be largely influenced by the changes in

---

[1] For more on this method of classifying the sources of countrywide income inequalities see Oshima [45] and Swamy [59].

[2] On the basis of expenditure data Minhas [41, p. 98] shows that inequality (measured by CR) has declined in rural India between 1956/57 and 1967/68. Swamy [59, p. 63] using similar data shows no change between 1951/52 to 1954/55 and 1955/56 to 1959/60.

TABLE XVI

CONCENTRATION RATIOS OF INCOMES FOR SELECTED COUNTRIES

Country	Year	Concentration Ratios
Bangladesh	1963/64	0.36
	1966/67	0.30
	1968/69	0.30
Sri Lanka	1953	0.50
	1963	0.49
	1969/70	0.34
India	1953/54 to 1956/57	0.34
	1961/62	0.35
Malyasia	1957/58	0.36
Philippines	1965	0.51
Republic of Korea	1966	0.26
Thailand	1962	0.50

Sources :

1. Bangladesh—Table XV.
2. Sri Lanka—Rasaputram [51].
3. India—1953/54 to 1956/57 : Ohja and Bhatt [A4]. 1961/62 : Sundrum [57].
4. Malaysia, Philippines, Republic of Korea and Thailand—Sundrum [57].

TABLE XVII

SECTORAL CONCENTRATION RATIOS

Country	Year	Urban	Rural
Bangladesh	1963/64	0.41	0.33
	1966/67	0.38	0.31
	1968/69	0.37	0.27
India	1961/62	0.47	0.34
Philippines	1965	0.53	0.43
Sri Lanka	1952/53	0.52	0.45
Thailand	1962/63	0.45	0.44

Sources:

1. Bangladesh—Table XV.
2. India, Philippines, Sri Lanka and Thailand—Sundrum [57].

these factors. Some of the more important ones affecting income inequality in developing countries are, population growth, household size, intra and intersectoral inequalities, diffusion of new technology, educational attainments and rates of return to education, inequality in the access to education, unemployment and underemployment, relative factor endowments, structure of taxation, public expenditure and transfer payments, distribution of wealth and rural works programme [57; 58; 59].

High population growth by way of maintaining a large and stable average family size (and also relatively stable dependency ratio) contributed significantly to the inequality as well as in its stability in the period between 1959 and 1961 in the rural areas.[1] The same is true of the urban areas during 1963/64 to 1968/69. However, the dependency ratio in the rural areas increased somewhat between 1961 and 1965 after which it declined steadily (Appendix Table VIII). The decline is, of course, reflected clearly in the reduction in inequality but the increase in the middle 60's does not show up in an increase in inequality. This may be due, on the one hand, to the low weight of dependency ratio as a factor affecting income distribution during the period under consideration, and on the other hand, to the fact that dependency ratio appears to be positively related to household income level (Appendix Table IX)[2] which has a depressing effect on income inequality.

Intra and intersectoral inequality is important in the context of the changes in overall inequality and this has already been commented upon. Diffusion of new technology in the rural areas is said to have a tendency to perpetuate or increase inequality, at least during the transitional phase. In Bangladesh the adoption of the HYV technology has not been as widespread as in many other parts of the developing world. To the extent it has been diffused, there does not seem to have been any adverse effect on income distribution upto 1968/69. In point of fact, as observed earlier, there was a slightly increasing trend in real wage earnings of the agricultural labourers during 1965-69. Evidence from Comilla Kotwali

---

[1] Dependency ratio by way of affecting total consumption level of the household, its saving and asset accumulation affects income and its distribution [58, p. 448].

[2] This is perhaps explained by the fact that in a traditional society with no social security provisions, poor relatives often live jointly with richer ones [10, p. 180].

Thana indicates a reduction—though marginal—in the inequality of income distribution of a sample of 122 farmers between 1963/64 and 1969/70 [2]. This finding is quite consistent with what has been observed here in the trend of rural income inequality during this period. However, perhaps one should not attach too much importance to this scanty piece of evidence. In fact, nothing definite can be said about the impact of HYV technology on income distribution in Bangladesh until relevant data are available for the period following 1968/69.

Like many other developing countries, educational attainment did seem to have contributed to the inequality in income distribution in Bangladesh, particularly in the organised urban sector. This has taken place primarily through the premium earned by the people with higher level of education. No hard data on rates of return to various levels of education are available. However, some evidence can be found in the recommendation of the Pay and Services Commission of the erstwhile Government of Pakistan [34]. Government Sector in Bangladesh like other countries in this region absorbs the majority of the educated population in its payroll. So, the differences in the rates of return to education offered by the government can be taken to be representative of the country as a whole. There has not been any significant change in this differential over the period under consideration although recently policies are being adopted to narrow the gap.

That there is widespread unemployment and under-employment in Bangladesh cannot be contested by anyone. However, the volume of unemployment and under-employment and its movement over time have never been estimated with any degree of confidence. Iftekhar Ahmed [1] estimates the volume of unemployment and under-employment in the rural area of Bangladesh at 32% of the total labour force and in the urban area of Bangladesh at 15% of the total labour force. On the basis of scattered evidence it is suggested by some authors that HYV technology being more labour intensive has created additional employment opportunities in rural Bangladesh [2]. It has also been supplemented by the employment created through the rural works programme [12]. Both of these, perhaps, had some effect on increasing real wage earnings of agricultural labourers and also in reducing inequality.

The structure of taxation in Bangladesh did not have any significant impact in reducing inequality. The emphasis over the period under consideration remained on indirect sources of revenue which had, if anything, regressive effect on income distribution in the sense that it contributed marginally towards increasing income inequality. On the other hand, however, public expenditure on social services and infrrstructure increased significantly over the period under consideration [29; 30]. Although it is very difficult in the context of Bangladesh to relate this expenditure to income distribution, yet one can speculate that this had some equalising effect on income distribution.

The most important factor affecting inequality is the distribution of wealth. Some evidence is available on the distribution of rural wealth in the form of operational holdings of land from survey data for 1960 [33], 1963/64, 1964/65 and 1967/-68 [22]. Limited data on ownership are available from surveys conducted by the Bangladesh Institute of Development Studies for years 1969/70 [46] and 1973 [5].[1] Relevant data are presented in Appendix Table VII. It is clear that in any year for which data are available, distribution of farm area is much more unequal than the distribution of rural income. It is found that 10% farm holdings operate or own more than 25% of the total farm area while bottom 10% operate or own less than 1% of the farm area. The inequality seems to have increased between 1960 and 1965 after which it reduced in 1967/68, when the degree of inequality appears to be similar to that of 1960. The evidence for 1969/70 indicates an increase in inequality again. However, it may be pointed out that the sample for 1969/70 is limited to irrigated areas only and refers to ownership. But one may speculate that introduction of HYV technology along with irrigation facilities after a period of time may contribute towards increasing inequality in ownership of rural properties and thus in perpetuating a high degree of inequality in rural income. Therefore, one may conclude that while during the early 60's the pattern of distribution of wealth in rural areas may have contributed towards increasing the degree of inequality in rural income, in the middle of 60's, the effect appears to have been reverse, although one cannot say anything definite about the trend of inequality in the later period. Only limited evidence is available for urban areas. Papanek [48] collected some data on the ownership of industrial assets in Pakistan for 1959 which indicated a high degree of concentration. Similar evidence has recently been compiled by White [61] for 1962 and 1968. In 1962, 43 families

---

[1] For the purpose of studying the effect of the distribution of farm holdings on the distribution of income, information on operational holding is perhaps more useful.

and groups accounted for 72.8% of all assets of private Pakistani controlled firms, the corresponding figure for 1968 being 73.7%.[1] What is more revealing the largest 20 groups controlled 68.6% of all non-financial assets of private Pakistani Firms listed on the Karachi and Dacca Stock Exchange. In East Pakistan the above 43 families and groups controlled 45.1% of total manufacturing assets of privately controlled firms.

IV. DISTRIBUTION AND PATTERN OF CONSUMER EXPENDITURE

It is undeniable that distribution of consumer expenditure is closely related to the distribution of income and the movement in the two over time will be highly correlated. Pattern of consumer expenditure depends, among many others, on the level of income, family size, social and physical environment, life style etc. While in Section I the level of living of the various groups of population was measured by real income per capita or real wage earnings an attempt will be made here to do the same by per capita consumer expenditure which is claimed by many to be a more direct measure of the level of living.

Sample surveys of the C. S. O. provide data on per capita consumer expenditure in rural and urban areas for a number of years. Survey data on average annual per capita consumer expenditure at 1966 prices are shown in Table XVIII. Clearly no pattern over time has emerged for either rural or urban areas. This finding is quite consistent with what was found in Section I about the long term trend in rural and urban real income per capita or the level of living.

One can also analyse the trend in per capita consumer expenditure by income group as shown in Appendix Table X and XI. However, since only three observations for rural areas and four for urban areas are available nothing conclusive can be said about the long term trend. It is interesting that the short term trend for individual income groups is identical with the trend for all groups discussed above. Clearly any year to year rise or fall in the average per capita consumer

---

[1] These figures refer to all non-financial assets listed on the Karachi Stock Exchange owned by the 43 families and groups. If one adds the assets of these owners listed on Dacca Stock Exchange, their share in total assets of private Pakistani controlled firms reduces to 68.6%.

TABLE XVIII

AVERAGE ANNUAL PER CAPITA CONSUMER EXPENDITURE

(Taka/1966 prices)

Year	Rural	Urban
1960	347.17	n.a.
1961	412.10	n.a.
1963/64	318.25	453.68
Jan.-June 1965	372.09	513.45
April-June 1966	n.a.	458.26
1966/67	347.60	470.94

Source: Appendix Table I.

expenditure appears to have been shared by all income groups. It is also observed that the per capita consumer expenditure rises with the income group. This happens in spite of the fact that size of the family is positively correlated with the household income level. The most important finding here is that the observed reduction in income inequality did not have any significant effect on the level of living of the average population (household) or for that matter population (household) in any income bracket.

Average pattern of consumer expenditure can be seen in Appendix Table XII. The difference between the pattern of consumption in the rural and urban areas is brought out very clearly in this Table. On the whole, in the rural areas about 70% of total expenditure is devoted to food and related items the corresponding figure for urban areas being 55%. Of the expenditure on food and related items about 70% is spent on cereals in the rural areas and 45% in the urban areas. There is no significant change in this pattern over the years for which data are available. Proportion of expenditure on fuel and lighting has gone up slightly in rural areas while it has gone down in urban areas. However, this proportion is always higher for rural areas than that for urban areas. This may be due to the problem of imputation in rural areas and may also be due to the fact that the requirement for fuel is higher in rural areas compared with the urban areas for such activities as boiling paddy etc. Expenditure on clothing and footwear as a proportion of total expenditure remains stable around 5.5% with only minor variations for rural areas while for urban areas there is a declining trend. However, the urban figure for Jan.-June 1965 appears too low which may be due to sampling error. As for rural-urban difference, the percentage expenditure on clothing and footwear is higher in the urban areas than in the rural areas. Finally, the proportion of expenditure on other items which include rent is much higher in the urban areas than in the rural areas. This proportion seems to have a declining trend in the urban areas, and an increasing trend in the rural areas. However, the declining trend in the urban areas is not very consistent. Only one general conclusion seems to follow for the average pattern of consumer expenditure as revealed by survey data. While there has been some change in the pattern of consumer expenditure in the rural areas, the change in the urban areas is not very perceptible. Clearly, the movement in income inequality showed up in the changes in the pattern of consumption more in the rural areas than in the urban areas.

C. S. O.'s quarterly surveys provide data on the pattern of consumer expenditure by income group. Appendix Tables XIII through XVII present data on consumer expenditure on food and related items by income group in different time periods in the rural and urban areas of Bangladesh. The proportion spent on food and related items declines as one moves up the income scale in both rural and urban areas. However, it declines much more rapidly in urban areas than in rural areas. For example, in 1963 64 in the rural areas, the proportion of expenditure on food and related items declines from 69% for the bottom income group to 61% for the top income group, the corresponding figures for urban areas being 65% and 37% (Appendix Table XIII). The trend is almost similar for other years. A similar trend was observed for India in 1960/61 [14, p. 27]. In all income groups the rural proportion is higher than the urban proportion. However, the of rural-urban difference becomes more pronounced with the increase in the level of income. In this respect, it seems that the changes in income distribution did not affect the pattern of consumer expenditure on food and related items, neither did such changes affect the rural-urban differences.

V. MEASUREMENT OF THE DIMENSION AND TREND OF POVERTY LEVEL IN BANGLADESH—SOME FINDINGS

Recently it is being suggested that the performance of an economy, particularly a developing economy, should be judged by the changes in the general poverty level of the country. Real income per capita or real consumption per capita, although useful in many respects as indicators of development, do not reveal clearly the magnitude of poverty prevailing in the country, neigther do they provide an adequate picture of the changes over time. To overcome this deficiency, the magnitude and trend in the poverty level in Bangladesh has been estimated on the basis of the C. S. O.'s quarterly survey data.

The procedure of finding the magnitude of poverty involves identifying a level of a per capita expenditure adequate to purchase a bundle of food and related items which is considered to satisfy the minimum need of a person.[1]

Determination of the minimum consumption requirement is compounded by a number of complex and interrelated problems. These problems arise due to, (a) finding an acceptable criterion for the choice of the minimum consumption basket, (b) choice of the representative item within each consumable group, and (c) choice of appropriate prices to value the minimum consumption bundle.

The minimum consumption basket can be identified by applying either the average norm or the nutritional norm. The first can be obtained from the quarterly survey data on consumption and income and the second from recommendations of nutritional experts. But there are problems with both. The average norm, to a large extent depends on value judgement and is completely divorced from nutritional considerations. The nutritional norm on the other hand does not take full account of cultural factors, cost implications and production and total availability considerations. Panikar [47] discusses some of these problems in the context of Kerala in India. As apparent from footnotes to Appendix Table XVIII,

---

[1] Non-food items like clothing, housing, health care and education should have been included in the minimum consumption bundle. However, there are serious problems in developing objective criterion for the determination of minimum requirement of these items. In the context of Bangladesh, it can be safely concluded that the inclusion of non-food items would result in a higher proportion of people being pushed below the poverty line.

the above mentioned factors along with nutritional requirements were taken into account while determining the minimum consumption basket. Problem with the choice of the representative item will always remain and some amount of value judgement is perhaps unavoidable. In this study evidence provided by the quarterly surveys was used to select the representative item. However, in a number of cases, availability of appropriate price data had to be taken into account. Choice of appropriate prices to value the minimum consumption basket and also the choice of appropriate pice index to deflate current price expenditure on food and related items by income group present the most complex problem. These are discussed in detail by Bardhan [7]. The contradictory results obtained by Bardhan [6; 8] and Minhas [41] on the changes in the magnitude poverty in India, were primarily due to their use of different consumer price index for deflating expenditure at current prices.

In this study retail prices of 1966 at the urban and rural markets were used to evaluate the minimum consumption basket separately for the rural and urban areas. Total consumer expenditure on food and related items by income group in current prices were deflated in the case of rural areas, by the consumer price index for rural areas and in the case of urban areas, by the consumer price index for industrial workers at Narayanganj. No attempt was made to use different price data or price indices for different income groups in the rural and urban areas. The basic data on the minimum required consumption per capita in Bangladesh are presented in Appendix Table XVIII. It is found that at the 1966 prices, the value of the minimum consumption basket in the urban and rural areas are Tk. 297.92 and Tk. 251.99 respectively. For convenience these have been rounded off at Tk. 298 and Tk. 252 determine the proportion and number of people below the poverty line in the urban and rural areas respectively at different points of time for which income consumption data by income group were available.

The percentages and numbers of people below minimum level of living as defined above are shown in Table XIX.[1]

---

[1] Sen [56] rightly criticises the use of a measure of proverty as done in the present study and other studies in India. According to him, if such a measure is generally accepted the tendency of the policy makers would be to concentrate on people whose level of living is close to the povert level. He suggests that poverty measures be modified in two directions. "(i) We should be concerned not merely with the number of people below the poverty line but also with the amounts by which the incomes of the poor fall short of the specific poverty level, and (ii) the bigger the shortfall from the poverty level, the greater should be the weight per unit of that shortfall in the poverty measure", [56. p. 1463].

The situation revealed in Table XIX is staggering. Between 1963 and 1969 more than 30 million people have been living below the poverty level in Bangladesh. The number was around 50 million in both 1963/64 and 1968/69. In the urban areas, though the absolute number increased, the proportion of people below the poverty line seems to have declined. This has happened in spite of the fact that the income inequalities did not change appreciably over this period. In the case of rural areas, no systematic trend is discernible. Both the proportion and the number of people below the poverty line fluctuated year to year. What is clearly established is that a large proportion of people in Bangladesh had a living standard below the poverty line in the 60's. Some figures for West Bengal in India may be quoted here. Bardhan [7, p. 1244] found that in West Bengal, the proportion of people below the poverty line increased from 22% in 1960/61 to 84% in 1968/69, a phenomenal increase indeed. On the other hand, Dandekar and Rath [14, p. 29] show that this proportion in 1961/62 were 44% and 49% for rural and urban areas respectively in West Bengal. What is most disconcerting in the case of Bangladesh is that, after showing some tendency to decline, the total number of persons in urban areas and both the proportion and the number in rural areas seem to have been on the increase in the late 60's. It is suspected that this trend has continued in the 70's.

TABLE XIX

PERCENTAGES AND NUMBERS OF PEOPLE BELOW MINIMUM LEVEL OF LIVING IN RURAL AND URBAN AREAS OF BANGLADESH

Year	Urban		Rural	
	Below Tk. 298		Below Tk. 252	
	%	Number (million)	%	Number (million)
1963/64	73.6	2.91	87.6	49.89
Jan.-June 1965	70.2	3.08	54.2	31.66
April-June 1966	81.9	3.83	n. a.	n. a.
1966/67	62.7	3.34	51.2	31.32
1968/69	62.4	3.88	71.3	45.76

Sources : Appendix Tables XIII through XVII.

Necessary data were not available to carry the above analysis into the 70's although it would have been very desirable. However, one can use the data on per capita annual expenditure on food and related items in rural and urban labour households in Bangladesh as presented in Appendix Table XIX, to get an impression of the trend in poverty level in Bangladesh in early 70's particularly in the post-liberation Bangladesh. It is clear from Appendix Table XIX, that during the three years 1971, 1972 and 1973, the level of expenditure on food and related items in rural and urban labour households was way below the poverty line particularly in the later two years. Considering the trend over these years in the difference between the expenditure level of this group and the poverty line, it appears that on the whole the proportion of people below the poverty line increased, at least in comparison with 1970. However, in the absence of detailed information on the pattern of consumer expenditure by income group nothing more can be said on the above.

VI. RURAL-URBAN SAVING: AVERAGE AND MARGINAL PROPENSITY TO SAVE

The level of income and its movement over time is likely to affect the volume of saving and also saving propensities. However, it is claimed that the latter is often influenced by the level of poverty as well as the pattern of income distribution. For example, people who are below the poverty line are likely to dissave or their saving will be an insignificant proportion of total income. On the other hand, it is suggested by many that the saving propensities are positively correlated with the degree of inequality in income. Ojha and Bhatt [43, p. 236] on the basis of data for India has supported the above hypothesis. Now, in addition to the problem of reliability of data, one can raise the question if such a relationship is likely to hold universally for all countries under all circumstances. An atlernative hypothesis may be that, in very poor countries, if the government and other organised sectors play an important part in providing saving, the overall propensity to save in that case may be quite unrelated to inequality in personal income distribution. However, in countries where the noncorporate private sector contributes the dominant share in total saving and also claims a large share in total income, measures should be adopted to raise the saving propensity of this sector, even if it is by a very small margin. This will have the most significant impact in terms of increasing the volume of saving and thus investment and income.

In the context of the present study and what is said above, it is important to relate the rural and urban income presented in Table I to rural and urban saving respectively. Eastimates of rural and urban saving in current prices are obtained from [3]. These estimates were deflated by the GDP (at factor cost) deflator to obtain estimates at constant (1959/60) prices. The constant price estimates along with the corresponding average and marginal propensity to save are presented in Table XX. It may be pointed out that because of lack of data the saving estimates (rural and urban) were limited to the period 1959/60 to 1969/70. In fact, the present series provides the first consistent set of estimates of rural and urban saving in Bangladesh over any length of time. The other attempt by Bergan in a study referred to earlier, related only to 1963/64 and the estimate was very crude. In particular the saving ratios obtained by Bergan were too high[1] when compared with other available evidence for either Bangladesh or any other developing country.

From Table XX it can be seen that in constant prices total rural saving goes up from Tk. 471 million in 1959/60 to Tk. 923 million in 1969/70. On the other hand, urban saving in constant prices goes up from Tk. 427 million in 1959/60 to Tk. 1095 million in 1969/70. Therefore, in ten years between 1959/60 and 1969/70, rural saving in constant prices increased by 95% i. e., by an annual compound rate of growth of 6.9%. Urban saving, on the other hand, increased by 156%, i. e., by an annual compound rate of growth of 9.9%. Rural saving as a percentage of total saving fluctuates between 54% in 1960/61 and 38% in 1965/66. However, the contribution of rural saving to total saving declines between 1959-65 and 1965-70. The average contribution of rural saving to total saving was 50% during 1959-65 and decreased to 44% during 1965-70.

Although the decline in the contribution of rural saving can be explained in terms of declining per capita rural income over time, as observed earlier, it is quite alarming that the sector which accounts for over 80% of the total income contributes only about half of the total saving of the economy. This has serious implication for resource mobilisation for economic development in the future.

---

[1] His estimate of gross personal savings as a % of gross personal income (before taxes) was 12% for rural areas and 9.9% for urban areas, thus producing at total savings rate of 11.8% for Bangladesh as a whole [10, p. 185].

TABLE XX

RURAL AND URBAN SAVING AT CONSTANT 1959/60 PRICES AND AVERAGE AND MARGINAL PROPENSITY TO SAVE IN BANGLADESH

Year	Saving		Average Propensity to Save		Marginal Propensity to Save	
	Rural (Tk. Million)	Urban (Tk. Million)	Rural	Urban	Rural	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
1959/60	471	427	4.24	14.04	23.40	14.18
1960/61	533	438	4.87	11.20		
1961/62	587	551	5.07	12.49		
1962/63	412	568	3.57	11.98		
1963/64	729	805	5.81	15.37		
1964/65	850	752	6.67	14.10		
1965/66	711	1113	5.44	19.83	12.53	—1.60
1966/67	730	889	5.55	15.57		
1967/68	844	946	5.88	15.30		
1968/69	805	1045	5.57	15.60		
1969/70	923	1095	6.25	16.25		

Average Rate of Saving : 1959/60—1964/65

Rural =5.04
Urban =13.20

1964/65—1969/70

Rural =5.74
Urban =16.51

Notes and Sources : Table 1 and [3].

Rural and urban saving at constant prices were arrived at by deflating the current price figures by the GDP (at factor cost) deflator, both obtained from [3].

This point is more sharply focussed if one carries out the analysis in terms of average and marginal popensities to save in rural and urban areas over the period under study.

As can be seen from Table XX, average propensity to save in rural areas fluctuates between 3.6% in 1962/63 and 6.7% in 1964/65. Two distinct phases are observed. The first one extends from 1959/60 to 1964/65 when the average propensity to save goes up from 4.2% in 1959/60 to 6.7% in 1964/65. In the second phase i. e., 1964/65 to 1969/70, the average propensity to save falls from 6.7% in 1964/65, to 5.4% in 1965/66 and then slowly moves up to 6.3% in 1969/70. Taking the end years' income and saving, the marginal propensity to save in rural areas of Bangladesh turns out to be 23.4% during 1959-65 and 12.5% during 1964-70. The average rate of saving for these two periods reveals an upward trend as it moves from 5.04% to 5.74%. It is interesting to note that the increase in saving-income ratios came at a time when income inequality was apparently declining.

It is clear from Table XX that the average propensity to save in urban areas, is much higher than that in rural areas. In some years the urban rate is almost three times the rural rate.[1] The urban average propensity to save fluctuates between 11.2% in 1960/61 and 19.8% in 1965 66. Although the average rate of saving moves upward from 14.0% in 1959/60 to 16.3% in 1969/70, there is no clear pattern as in the case of rural saving. It seems that there were more fluctuations in the urban than in the rural saving rate. However, comparing the periodic averages it is found that the rate goes up from 13.2% in 1959-65 to 16.5% in 1964-70. Again increase in the saving-income ratios took place without any increase in income inequality.

For a further insight into the saving income relationship in rural and urban areas during the period under study, two saving functions were estimated by applying least squares regression. The results are presented below. All variables are expressed in taka million at 1959/60 constant prices.

---

[1] For the period 1953/54 to 1956/57 Ojha and Bhatt [43, p. 236] estimated rural and urban saving-income ratios for the household sector in India at 2.6% and 14.4% respectively.

(a) For rural areas,

$$S_R = -701.13 + 0.109\, Y_R$$
$$\quad (2.88) \quad (5.74)$$

$R^2 = 0.79$ and standard error of estimate $= 81.71$.

(b) For urban areas,

$$S_U = 291.39 + 0.206\, Y_U$$
$$\quad (1.88) \quad (7.10)$$

$R^2 = 0.85$ and standard error of estimate $= 105.41$.

S and Y represent saving and income respectively while R and U represent rural and urban areas. Figures within parentheses represent t-statistics. Clearly the results indicate a much higher marginal propensity to save in urban areas (0.21%) as compared with rural areas (0.11%). In the case of rural areas only 79% of the variation in total saving is explained by income. It seems there are other variables, perhaps many institutional ones that affect rural saving.

In this context one further remark must be made. From a comparison of the marginal propensity to save in rural and urban areas as estimated above one may be tempted to conclude that it is desirable to transfer income from rural to urban areas in order to increase the total saving and investment in the economy. However, considering the fact that the bulk of the income (over 80%) originates in the rural areas, greater emphasis should be given to the adoption of measures for raising the propensity to save in this area rather than relying on the transfer of income as suggested above. In the ultimate analysis, raising of the rural propensity to save will produce a much greater impact on the total saving effort of the economy than augmenting the urban income base through transfer. A similar kind of fallacy is observed in the argument favouring transfer of income towards the non-wage earning class as opposed to wage earners. Therefore, as suggested above, studies should be carried out in the future to find out ways for increasing the rate of saving in the rural areas of Bangladesh.

Clearly, low level of real income, high degree of inequality and poverty have interacted to depress the saving performance of the Bangladesh economy. However, these factors seem to have reinforced one another in the case of rural areas. The situation would appear even more discouraging if one estimated the saving propensities of the household sector in the two areas. A full blown analysis of the relationship between inequality, poverty and saving could not be undertaken in the absence of independent estimate of saving of the household sector by income group. The data provided by the quarterly surveys were inadequate to attempt such an exercise.

VI. CONCLUDING REMARKS

The findings of the present study are not very surprising except that reduction in income inequality over time was not quite expected. All attempts at planned economic development over the last two decades did not in any way affect the living standard of the majority of the people. The trend in real income and consumption has been more depressing in the post-liberation Bangladesh as compared with the earlier periods. A fast rise in the cost of living indices due to galloping inflation seem to have more than offset the rise in nominal earnings. In terms of the redistributive impact of the inflation it is apparent that the poorer section of the population have been hit harder than others. Although all sections of the fixed income earning group have taken severe cut in their real income, yet it seems that through redistribution of consumption expenditure and also by virtue of subsidized supply of foodgrains and other essentials some among them have managed to stay above the poverty line.

What is perhaps a matter of genuine concern in this respect, is the magnitude of poverty in Bangladesh. Clearly, all attention of the policy makers should be devoted towards adopting measures for reducing the extent of poverty. However, there is need for gaining further knowledge on the subject. What this study has succeeded in doing is to speculate on the magnitude and trend of poverty level. It is extremely important to know about the structure of poverty, in terms of regional distribution and distribution by social groups. It must, however, be recognised that a significant reduction in poverty cannot come about without a complete restructuring of the production and distributional system in the country. In the initial stage the need is for organising the production system on the basis of a plan which will take as its prime consideration the minimum consumption need of the people. However, the problem of an equitable distribution of income originating from the production activities in the economy, cannot be minimised. The success of planning in Bangladesh will depend entirely upon the extent to which it incorporates the above elements into its development programmes.

REFERENCES

1. Ahmed, Iftikhar, "Employment in Bangladesh—Problems and Prospects", A paper presented at the International Economic Association Conference on the economic development of Bangladesh within the framework of a socialist economy, held at Dacca, January 1973.

2. Akhanda, A. M., "Impact of High Yielding Varieties of Rice in Comilla Kotwali Thana in Bangladesh", A paper presented in a Study Seminar on "Economic and Social Consequences of the Improved Seeds", held at Sri Lanka, April 19 to May 20, 1973.

3. Alamgir, M. and Berlage, L., *Bangladesh: National Income and Expenditure* 1949/50—1969/70, Research Monograph No. 1, Bangladesh Institute of Development Studies, Dacca, 1974.

4. ___________ and Rahman, A., *Saving in Bangladesh* 1959 60—1969/70, Research Monograph No. 2, Bangladesh Institute of Development Studies, Dacca, 1974.

5. Asaduzzaman, M., "Kaliganj Villages: An Economic Survey", Bangladesh Institute of Development Studies, 1973 (mimeo).

6. Bardhan, P. K.,"On the Incidence of Poverty in Rural India of the Sixties", *Economic and Political Weekly*, Vol. VIII, Nos. 4-6, Annual Number 1970.

7. ___________, "Green revolution and agricultural labourers", *Economic and Political Weekly* Special No. 1970.

8. ___________ "On the minimum level of living and the rural poor", *Indian Economic Review*, Vol. V (New Series) No. 1, April 1970.

9. ——————, and Srintivasan, T. N., "Income Distribution: Patterns, Trends and Policies" *Economic and Political Weekly*, April 24, 1971.

10. Bergan, Asbjorn, "Personal Income Distribution and Personal Saving in Pakistan, 1963-64", *The Pakistan Development Review*, Vol. VII, No. 2, Summer 1967.

11. Bhatt, V. V., "Estimates of Saving and Investment in the Indian Economy", *Reserve Bank of India Bulletin*, August 1961.

12. Bose, S. R., "Trend of Real Income of the Rural Poor in East Pakistan 1949-66", *The Pakistan Development Review*, Vol. VIII, No. 3, Autumn, 1968.

13. ——————, "Movement of Agricultural Wage Rates in Bangladesh, 1949-73", in Mitra, A. (ed.) *Economic Theory and Planning, Essays in Honour of A. K. Das Gupta*, (Calcutta: Oxford University Press, 1974).

14. Dandekar, V. M. and Rath, N., "Poverty in India", *Economic and Political Weekly*, January 2, 1971.

15. Government of Bangladesh, Directorate of Agriculture, *Weather and Crop Report* (Supplement to Dacca Gazette) (different issues).

16. ——————, Bureau of Statistics, *Quarterly Economic Indicators*; (different issues).

17 ——————, ——————, Price Statistics of Some Selected Items in Dacca; different issues (mimeo).

18 ——————, ——————, *Statistical Digest of Bangladesh*, 1970-71 and 1972.

19. ——————, ——————, *Monthly Statistical Bulletin of Bangladesh* (different issues).

20. Government of East Pakistan, ——————, Quarterly Bulletin of Wage Rates in East Pakistan, Quarter ending 31st March, 1970 (mimeo).

21. ——————, ——————, *Statistical Digest of East Pakistan*, 1965, 1968.

22. ——————, ——————, *Master Survey of Agriculture*, Second Round, Sixth Round, Seventh Round (Second Phase).

23. ——————, ——————, *Monthly Bulletin of Statistics* (different issues).

24. Government of Pakistan, Central Statistical Office, *Pakistan Statistical Year Book*, 1968.

25. ——————, ——————, *Monthly Statistical Bulletin* (various issues).

26. ——————, ——————, National *Sample Survey* 1959, 1960 and 1961 (First, Second and Third rounds).

27. Government of Pakistan, Central Statistical Office, *The Quarterly Survey of Current Economic Conditions*, 1963-64, Jan. -June 1965, April-June 1966, 1966-67 and 1968-69.

28. ——————, ——————, *Summary Report of Population and Labour Force in Pakistan*, (July 1966-June 1967).

29. Government of Pakistan, Planning Commission, *Final Evaluation of the Second Five Year Plan.*

30· ——————, ——————, *Evaluation of the Third Five Year Plan.*

31. ——————, ——————, *The Fourth Five Year Plan*, 1970-75.

32. ——————. Office of the Census Commissioner, *Census of Pakistan* 1951 *and* 1961.

33. ——————, Agricultural Census Organisation, *Pakistan Census of Agriculture*, Vol. 1.

34. ——————————, *Report of the Pay and Services Commission* 1959-62.

35. Griffin, Keith B., "Financing Development Plans in Pakistan", *The Pakistan Development Review*, Vol. V., No. 4, Winter 1965.

36. Gunatilleke, Godfrey, "The Rural-Urban Balance and Development—The Experience in Sri Lanka", *Marga*, Vol. 2, No. 1, 1973.

37. Haq, Khadija, "A Measurement of Inequality in Urban Personal Income Distribution in Pakistan, *The Pakistan Development Review*, Vol. IV, No. 4, Winter 1965.

38. Iyengar N. S. and Bhattacharya N., "On the Effect of Differentials in Consumer Price Index on Measures of Inequality", *Sankhya*, Series B, Vol. 27, September 1965.

39. Jose, A. V., "Wage Rates of Agricultural Labourers in Karala", *Economic and Political Weekly*, Annual Number, 1973.

40. Khan, Irshad M., "Aggregative Analysis of Food Consumption in Pakistan" *The Pakistan Development Review*, Vol. IX, No. 4, Winter 1969.

41. Minhas, B. S., "Rural Poverty, Land Redistribution and Development Strategy: Facts and Policy" *Indian Economic Review*, Vol. V., No. 1, April 1970.

42. Ojha, P. D. and Bhatt, V. V., "Distribution of Income in the Indian Economy 1953-54 to 1956-57", *Reserve Bank of India Bulletin*, September, 1962.

43. ——————————, "Some Aspects of Income Distribution in India", *Bulletin of the Oxford University Institute of Economics and Statistics*, Vol. 26, 1964.

44. ——————————, "Pattern of Income Distribution in Underdeveloped Economy", *American Economic Review*, Vol. 54, 1964.

45. Oshima, Harry T., "Income Inequality and Economic Growth: The Postwar Experience of Asian Countries", *The Malyan Economic Review*, Vol. XV, No 2, October 1970.

46. Pakistan Institute of Development Economics, "Survey of Farms in East Pakistan" (unpublished data).

47. Panikar, P. G. K., "Economics of Nutrition", *Economic and Political Weekly*, Annual No. 1972.

48. Papanek, G. F., *Pakistan's Development—Social Goals and Private Incentives* (Cambridge, Mass: Harvard University Press, 1967).

49. Perera, L. N., Fernando, W. S. M., De. Mel, Beatrice V. and Poleman, "The Effect of Income on Food Habits in Ceylon: The Finding of the Socio-Economic Survey of Ceylon 1969-70", *Marga*, Vol. 2, No. 1, 1973.

50. Poleman, T. *et. al.*, "The Effect of Income on Food Habits in Sri Lanka", *Nutrition Newsletter*, Vol. II, No. 3, July-September 1973.

51. Rasaputram, Warnasena, "Changes in the Pattern of Income Inequality in Ceylon", *Marga*, Vol. 1, No. 4, 1972.

52. Research and Planning Division, ECAFE Secretariat, "On the Measurement of Mass Poverty in India", *Economic Bulletin for Asia and the Far East*, Vol. XXIII, No. 3, December 1972.

53. Reserve Bank of India, Division of Development and Planning, "Eastimates of Saving in the Indian Economy", *Reserve Bank of India Bulletin*, March 1960.

54. Revelle, R. *et. al.*, *Population Projections for Bangladesh* 1973-2003, Harvard University Center for Population Studies (mimeo).

55. Richards, Peter J., "Income, Wages and Consumption Patterns in Ceylon", *Marga*, Vol. 2, No. 1, 1973.

56. Sen, A. K., "Poverty, Inequality and Unemployment—Some Conceptual Issues in Measurement", *Economic and Political Weekly Special* No. 1973.

57. Sundrum, R. M., "The Distribution of Incomes in the ECAFE Region: Causal Factors and Remedial Policies", *Economic Bulletin for Asia and the Far East*, Vol. XXIII No. 3 December 1972.

58. ________________ "Aspects of Economic Inequality in Developing Countries", *The Bangladesh Economic Review*, Vol. II, No. 1, January 1974.

59. Swamy, S., "Structural Changes and the Distribution of Income by Size", *Review of Income and Wealth*, June 1967.

60. Vaidyanathan, A., Some aspects of inequalities in living standards in India", paper presented at the New Delhi Seminar on Income Distribution, March 1971.

61. White, Lawrence J., *Industrial Concentration and Economic Power in Pakistan*, (Princeton: Princeton University Press, 1974.)

Appendix

TABLE I

MOVEMENT OF RURAL AND URBAN AVERAGE PERSONAL INCOME PER CAPITA AS INDICATED BY C. S. O. SURVEY DATA

(Taka/current prices)

Year	Annual Personal Income Per Capita		
	Rural	Urban	Total[1]
1959	287	n.a.	n. a.
1960	299	n.a.	n. a.
1963/64	325	437	332
Jan.-June 1965	309	476	320
April-June 1966	n.a.	480	n. a.
1966 67	346	499	358
1968 69	370	550	386

[1] Weighted average of rural and urban data, weights being the relative distribution of rural and urban population as given in Appendix Table XX.

Sources: [26; 27].

TABLE II

WAGE RATES OF AGRICULTURAL LABOURERS AS REPORTED BY DIRECTORATE OF AGRICULTURE (D.A.)

(Taka per worker)

Year	Nominal Wage[1] (Tk./per day)	Annual Wage[2] Earnings	Index of Nominal Wage (1966=100)
	(1)	(2)	(3)
1949	1.92	497	80.03
1950	1.62	419	67.47
1951	1.55	402	64.73
1952	1.53	396	63.77
1953	1.38	357	57.49
1954	n. a.	n. a.	n. a.
1955	1.31	339	54.59
1956	n. a.	n. a.	n. a.
1957	1.70	441	71.01
1958	1.86	480	77.29
1959	1.85	478	76.97
1960	1.95	506	81.48
1961	2.18	564	90.82
1962	2.24	681	93.56
1963	2.41	624	100.48
1964	2.65	687	110.63
1965	2.34	606	97.58
1966	2.40	621	100.00
1967	2.59	671	108.05
1968	2.75	712	114.65
1969	3.12	808	130.11
1970	3.00	777	125.12
1971	3.15	816	131.40
1972	3.94	1020	164.25
1973	5.59	1450	233.49

[1] Adjusted by days of employment of an average labourer in each month.

[2] Total number of days employed in each year was assumed to be 259 days as in Bose's [12, p. 464].

Sources : 1949—1966—Bose, S. R. [12, p. 464].

1967—1973—Appendix Table III.

TABLE III

AVERAGE DAILY WAGES IN TAKA (WITHOUT FOOD) AND MONTHLY EMPLOYMENT IN DAYS OF AGRICULTURAL LABOURERS

Year	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Average
1967	2.86	2.45	2.88	3.02	2.49	2.37	2.45	2.39	2.49	2.42	2.45	2.85	2.60 (2.59)
1968	2.71	2.75	2.89	2.49	3.19	2.57	2.54	2.57	2.98	2.95	2.64	2.71	2.75 (2.75)
1969	3.01	3.01	3.11	3.31	3.20	3.18	3.19	3.06	3.12	3.06	3.01	3.13	3.12 (3.12)
1970	2.67	2.72	2.74	n.a.	n.a.	3.06	n.a.	n.a.	n.a.	3.23	3.26	3.21	2.98 (3.00)
1971	3.19	n.a.	n.a.	2.98	3.04	3.00	3.16	3.31	3.12	3.17	3.19	3.37	3.15 (3.15)
1972	3.15	3.23	3.52	3.90	3.83	3.76	3.83	4.19	4.37	4.31	4.35	4.67	3.93 (3.94)
1973	4.78	4.91	5.14	5.36	5.47	5.72	6.02	5.91	5.70	5.83	5.93	6.32	5.59 (5.60)
No. of Days Employed each Month	20	20	22	23	21	22	18	23	22	23	23	22	

Notes: Figures within parentheses in the last column represent average wages adjusted for the number of day's employed during each month.

Sources: Wages—[15].

Number of days employed in each month—[12, p. 481].

TABLE IV

WAGE RATES OF UNSKILLED AGRICULTURAL LABOURERS AS REPORTED BY BUREAU OF STATISTICS (B.S.)

Year	Nominal Wage (Taka/per day) (1)	Annual Wage Earnings[3] (2)	Index of Nominal Wage (1966=100) (3)
1962	2.21	572	78.57
1963	2.45	635	87.23
1964	2.41	624	85.71
1965	2.47	640	87.91
1966	2.81	728	100.00
1967	2.90	751	103.16
1968	2.99	774	106.32
1969	2.88	746	102.47
1970	2.97[2]	769	105.63
1971	3.06[1]	793	108.93
1972	2.58	668	91.76
1973	4.32[2]	1119	153.71

[1] Jan.-Sept. except April and May.

[2] Jan.-June.

[3] Total numbr of days employed in a year was assumed to be 259 days as in Bose's study [12].

Sources: [16; 19; 20; 23].

TABLE V

WAGE RATES OF UNSKILLED URBAN LABOURERS

(Taka/day)

Year	Helper in Construction	All Unskilled Workers Nominal Wage (Taka/per day)	Annual Wage Earnings			
			Helper in Construction		All Unskilled Workers	
			Tk.	Index (1966=100)	Tk.	Index (1966=100)
	(1)	(2)	(3)	(4)	(5)	(6)
1958	2.11		633	61.2		
1959	2.23		669	64.9		
1960	2.52		756	73.3		
1961	2.72		816	79.1		
1962	3.00	2.51	900	87.2	753	81.8
1963	3.33	2.78	999	96.8	834	90.6
1964	3.61	2.93	1083	104.9	879	95.4
1965	3.39	2.95	1017	98.5	885	96.1
1966	3.44	3.07	1032	100.0	921	100.0
1967	3.44	3.14	1032	100.0	942	102.3
1968	3.74	3.36	1122	108.7	1008	109.4
1969	3.51	3.59	1053	102.0	1077	116.9
1970	3.73	3.60	1119	108.4	1080	117.3
1971	3.69	4.10	1107	107.3	1230	133.6
1972	4.12	4.10	1236	119.8	1230	133.6
1973	5.28[1]	4.88[1]	1584	153.5	1464	159.0

[1] Jan.—June.

[2] It was assumed that a wotker was employed 300 days in a year.

Sources : [16 ; 18 ; 19 ; 20 ; 21 ; 23].

TABLE VI

CONSUMER PRICE INDEX FOR AGRICULTURAL LABOURERS*

(1966=100)

Items	Weight	1966	1967	1968	1969	1970	1971	1972	1973
Rice (md.)	60.5	46.10 (100.00)	42.50 (92.19)	46.23 (100.28)	44.78 (97.13)	45.30 (98.26)	58.48 (126.85)	72.00 (156.18)	102.40[1] (222.10)
Wheat (md.)	4.3	30.96 (100.00)	29.92 (96.64)	29.40 (94.96)	25.84 (83.84)	28.00 (90.44)	31.52 (101.81)	41.20 (133.07)	50.00[2] (161.50)
Pulses (md.)	1.8	43.70 (100.00)	47.70 (109.15)	48.30 (110.53)	42.60 (97.48)	49.90 (114.19)	57.20 (130.89)	80.80 (184.47)	124.00[2] (283.75)
Milk, Fish (Ruhit-seer) Mutton, Chicken Eggs,	6.9	3.65 (100.00)	3.80 (104.11)	3.67 (100.55)	3.71 (101.64)	3.98 (109.04)	4.56 (124.93)	5.00 (136.99)	10.33[2] (283.01)
Fruits and Vegetables (banana—Sabri per 4)	5.6	0.56 (100.00)	0.48 (85.71)	0.47 (83.93)	0.49 (87.50)	0.58 (103.57)	0.62 (110.71)	0.86[3] (156.57)	1.36[1] (242.86)
Edible Oil (Mustard-seer)	3.7	4.78 (100.00)	4.31 (90.17)	3.77 (78.87)	4.47 (93.51)	5.35 (111.92)	6.70 (140.17)	9.92[3] (207.53)	12.37 (258.79)
Salt (Karachi local-seer)	1.1	0.30 (100.00)	0.34 (113.33)	0.34 (113.33)	0.32 (106.67)	0.30 (100.00)	0.46 (153.33)	0.41[1] (136.67)	0.40 (133.33)

(Contd.)

TABLE VI (Contd.)

Items	Weight	1966	1967	1968	1969	1970	1971	1972	1973
Chillies (seer)	1.5	4.01 (100.00)	2.98 (74.31)	3.87 (96.51)	3.80 (94.76)	3.79 (94.51)	5.28 (131.67)	4.92 (122.69)	4.87 (121.45)
Spices (onion-seer)	1.4	0.65 (100.00)	0.43 (66.15)	1.08 (166.15)	0.73 (112.31)	0.89 (136.92)	0.76 (116.92)	0.73^{1} (112.31)	1.64 (252.31)
Gur (seer)	0.9	1.13 (100.00)	1.05 (92.92)	1.50 (132.74)	1.53 (135.40)	1.40 (123.89)	2.05 (181.42)	3.11^{3} (275.22)	5.57^{1} (315.93)
Lighting (white kerosine-bottle of 22 oz.)	1.9	0.38 (100.00)	0.36 (94.74)	0.35 (92.11)	0.34 (89.47)	0.42 (110.53)	0.83 (218.42)	0.92^{3} (242.11)	1.26 (338.58)
Clothing (long cloth-medium quality per yd.)	4.3	1.77 (100.0)	1.78 (100.00)	1.85 (104.52)	2.03 (114.69)	2.25 (127.12)	2.99 (168.93)	5.89^{3} (332.77)	11.19 (632.20)
Tobacco (motihari—seer)	1.6	5.86 (100.00)	5.27 (89.93)	9.30 (158.70)	7.47 (127.47)	7.08 (120.82)	9.19 (156.83)	16.45^{3} (280.72)	22.04 (376.11)
Pan etc. (med.-*Bira*)	4.5	0.96 (100.00)	0.75 (78.13)	0.80 (83.33)	0.73 (76.04)	0.87 (90.63)	1.12 (116.67)	2.25^{1} (234.21)	2.48 (258.33)
Consumer Price Index		100.00	92.42	100.00	96.92	102.20	129.58	170.76	250.03

*Figures outside parentheses are prices in Taka and within parentheses are price indices.

Notes: 1. Jan.-June.

2. July-Sept.

3. July-Dec.

Sources: [16; 17; 18; 23].

TABLE VII

DISTRIBUTION OF FARM AREA IN BANGLADESH BY ORDINAL GROUPS

Cumulated % of Farms	Percentage of Farm Area					Kaliganj 1973	Percentage of Farm Area
	1960 (1)	1963/64 (2)	1964/65 (3)	1967/68 (4)	1969/70 (5)		
Bottom 5% Owns	0.38	0.12	0.20	0.47	0.36		
Bottom 10% Owns	0.77	0.24	0.40	0.94	1.06		
Bottom 20% Owns	2.27	0.48	0.80	3.04	3.16		
Bottom 30% Owns	5.89	0.78	1.20	6.60	4.63		
Bottom 40% Owns	10.70	2.04	2.81	11.30	9.14		
Bottom 50% Owns	15.52	4.36	6.80	16.77	13.43		
Bottom 60% Owns	25.00	8.55	13.88	24.62	17.72	Bottom 30% Owns	9.87
Bottom 70% Owns	35.00	28.17	24.33	34.32	22.20	Bottom 50% Owns	11.02
Bottom 80% Owns	46.75	52.04	39.32	46.97	29.25	Bottom 75% Owns	44.29
Bottom 90% Owns	63.71	75.94	62.08	64.15	37.90	Bottom 90% Owns	76.71
Bottom 95% Owns	77.29	87.89	75.00	76.61	43.63	Bottom 95% Owns	79.50
Bottom 100% Owns	100.00	100.00	100.00	100.00	100.00	Bottom 100% Owns	100.00
Concentration Ratio	0.49	0.53	0.60	0.48	0.65		0.46

Sources : 1. Estimated from [22; 33; 46].

2. Data on Kaliganj Thana obtained from [5].

TABLE VIII

DEPENDENCY RATIO IN RURAL AND URBAN AREAS OF BANGLADESH

Year	Rural	Urban
1959	2.7[a]	n. a.
1960	2.5	n. a.
1961	2.6	n. a.
1963/64	2.9	3.1
Jan.-June 1965	2.8	3.1
April - June 1966	n. a.	3.1
1966/67	2.5[b]	3.2[c]
1968/69	2.2[b]	3.0[c]

Notes:

[a] Assuming the same number of earners per family as in 1960.

[b] Assuming the same number of earners per family as in January-June 1965.

[c] Assuming the same number of earners per family as in April - June 1966.

Source: Appendix Table XIV.

TABLE IX

AVERAGE FAMILY SIZE AND NUMBER OF EARNERS PER HOUSEHOLD BY INCOME GROUP IN RURAL AND URBAN AREAS IN BANGLADESH

	Monthly Household Income Groups													
	Less than 50	50—99	100—149	150—199	200—249	250—299	300—399	400—499	500—749	750—999	1000—1499	1500—1999	2000	All Groups
Rural														
1960	2.7	4.2	5.4	6.9	7.0	8.4	8.5	9.1	13.5[a]					5.3 (1.5)
1961	2.5	4.2	5.2	6.0	7.7	7.3	8.5	9.1	12.1[a]					5.4 (1.5)
1963/64	2.5	4.2	5.3	6.1	6.7	7.9	9.3	11.7	12.3[b]	14.3[c]	14.8[d]			5.5 (1.4)
Jan.—June 1965	2.7 (1.1)	4.1 (1.2)	5.5 (1.4)	6.6 (1.6)	7.5 (1.9)	8.2 (1.8)	9.3 (2.0)	11.0 (2.8)	12.3 (2.2)	16.1 (1.7)	19.5 (2.5)	20.5 (4.5)	21.0 (3.0)	5.7 (1.5)
1966/67	2.4	3.9	4.8	5.9	6.8	7.4	8.6	9.9	13.5	16.3				5.2
1968/69	1.8	3.5	4.4	5.4	6.2	6.9	8.1	9.2	10.3	11.7				4.8
Urban														
1963/64	2.3 (1.1)	3.9 (1.2)	5.1 (1.3)	5.9 (1.4)	6.9 (1.7)	7.5 (1.7)	7.9 (1.6)	7.7 (1.7)	8.9[b] (1.7)	9.4[c] (1.8)	10.8[d] (2.2)			5.7 (1.4)
Jan.—June 1965	1.7 (1.1)	3.7 (1.1)	4.8 (1.2)	5.3 (1.3)	6.3 (1.5)	7.0 (1.7)	8.0 (1.6)	8.2 (1.7)	8.0 (1.4)	9.1 (1.5)	8.8 (1.8)	12.0 (1.0)	11.5 (2.5)	5.7 (1.4)

(Contd.)

TABLE IX (Contd.)

	Monthly Household Income Groups													
	Less than 50	50—99	100—149	150—199	200—249	250—299	300—399	400—499	500—749	750—999	1000—1499	1500—1999	2000	All Groups
April—June 1966	3.0 (1.0)	3.5 (1.1)	4.6 (1.1)	5.3 (1.4)	6.0 (1.6)	7.1 (1.5)	8.1 (1.6)	7.8 (1.9)	7.3 (1.2)	12.0 (1.3)	7.3 (1.3)	13.0 (2.0)		5.3 (1.3)
1966/67	2.3	3.7	4.5	5.1	6.2	6.8	7.3	8.2	7.9	9.6	9.3	11.5	13.0	5.5
1968/69	1.3	3.0	4.0	4.9	5.8	6.4	7.0	7.0	7.7	8.9	9.9	6.0	6.7	5.2
	Annual Household Income													
Groups	300 or less	301—600	601—1000	1001—2000	2001—3000	3001—4000	4001—6000	over 6000						
1959-Rural	1.8	3.2	4.4	5.7	7.7	8.9	10.4	13.3						5.6

Notes:

[a]500 and above income group.

[b]500—699 income group.

[c]700—899 income group.

[d]900 and above income group.

[e]Figures within parentheses represent average number of earners per family.

Sources: [26; 27].

TABLE X

AVERAGE ANNUAL PER CAPITA CONSUMER EXPENDITURE BY INCOME GROUP

(Taka/current prices)

Monthly Household Income Groups (Taka)	1960	1961	1963/64		Jan.-June 1965		April-June 1966	1966/67	
	Rural	Urban	Rural	Urban	Rural	Urban	Urban	Rural	Urban
All Groups	276.0	339.6	262.52	392.52	310.70	467.60	458.26	347.60	470.94
Less than 50			179.52	206.76	212.77	482.87	159.84	257.48	302.07
50— 99			205.68	239.52	244.01	259.79	285.01	259.47	284.92
100— 149			245.64	283.08	284.51	316.95	320.39	317.27	341.36
150— 199			269.76	324.36	314.40	393.19	381.33	349.18	397.46
200— 249			300.72	347.64	348.31	408.01	430.92	388.76	419.40
250— 299			309.36	365.64	386.59	464.74	459.39	420.98	462.91
300— 399			335.16	454.68	403.73	538.10	472.83	453.48	530.75
400— 499	—not available—	—not available—	358.56	591.72	463.09	626.91	645.61	517.54	589.33
500— 749					489.60	821.38	925.94	576.89	803.34
750— 999					512.95	1134.33	683.44	659.24	979.82
1000—1499					475.09	1156.77	1635.04	762.45	1250.36
1500—1999					664.92	1269.96	1237.33		1403.82
2000—above					1299.28	1964.70			1871.05
(1960 and 1961 figures)									
400—above									
(1963/64 figures)									
500—699			372.96	622.32					
700—899			461.88	873.36					
900—above			466.80	1039.68					

Sources : [26 ; 27].

TABLE XI

AVERAGE ANNUAL PER CAPITA CONSUMER EXPENDITURE BY INCOME GROUP

(Taka constant 1966 prices)

Monthly Household Income Groups (Taka)	1960	1961	1963/64		Jan.-June 1965		April-June 1966	1966/67	
	Rural	Rural	Rural	Urban	Rural	Urban	Urban	Rural	Urban
All Groups	347.17	412.10	318.25	453.68	372 09	513.45	458.26	347.60	470.94
Less than 50	—not available—	—not available—	217.60	238.97	254.81	530.22	159.84	257.48	302.07
50— 99			249.31	276.84	292.22	285.26	285.01	259.47	284.92
100— 149			297.75	327.18	340.73	348.03	320.39	317.27	341.36
150— 199			326.98	374.90	376.53	431.74	381.33	349.18	397.46
200— 249			364.51	401.80	417.14	448.02	430.92	388.76	419.40
250— 299			374.98	422.61	462.98	510.31	459.33	420.98	462.91
300— 399			406.25	525.52	483.51	590.89	472.89	453.48	530.75
400— 499			434.62	683.91	554.60	688.38	645.61	517.54	589.33
500— 749					586.35	901.92	925.94	576.89	803.34
750— 999					614.31	1245.55	683.44	659.24	979.82
1000—1499					568.97	1270.02	1635.04	762.45	1250.36
1500—1999					796.31	1394.45	1237.33		1403.82
2000—above					1556.02	2157.35			1871.05
1963/64 figures)									
500— 699			452.07	719.28					
700— 899			559.85	1009.43					
900—above			565.82	1201.66					

Note : Figures in this Table are derived by deflating the corresponding figures in Appendix Table X by the consumer price index for rural areas and that for industrial workers at Narayanganj.

TABLE XII

PERCENTAGE DISRTIBUTION OF CONSUMER EXPENDITURE BY MAJOR ITEMS OF CONSUMPTION

Items	1959	1960	1961	1963/64		Jan.-June 1965		April-June 1966	1966/67	
	Rural	Rural	Rural	Rural	Urban	Rural	Urban	Urban	Rural	Urban
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Cereals	48.6	49.4	38.3	40.8	26.1	41.3	25.4	28.9	48.0	30.4
2. Other Food Items	24.2	21.8	28.7	27.2	30.0	29.5	34.2	32.1	25.8	32.1
3. Fuel & Lighting	5.9	5.3	7.4	7.3	6.9	6.8	5.8	6.3	6.1	6.1
4. Clothing & Footwear	5.6	5.2	6.3	6.0	7.1	5.6	3.5	6.4	5.3	6.3
5. Others	15.7	18.3	19.3	18.7	29.9	16.8	31.1	26.3	14.8	25.1

Sources : [26; 27].

TABLE XIII

CONSUMER EXPENDITURE ON FOOD AND RELATED ITEMS BY INCOME GROUP, 1963/64

(Taka/1966 prices)

Monthly Household Income Groups (Taka)	Rural				Urban			
	Percent of Population	Annual Per Capita Consumer Expenditure	Percentage Distribution of Expenditure on Food and Related Items	Annual Per Capita Expenditure on Food and Related Items	Percent of Population	Annual Per Capita Consumer Expenditure	Percentage Distribution of Expenditure on Food and Related Items	Annual Per Capita Expenditure on Food and Related Items
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Less than 50	3.3	217.60	69.0	150.00	1.8	238.97	64.6	154.37
50 — 99	23.8	249.31	70.3	175.26	15.0	276.84	65.8	182.16
100 — 149	26.1	297.75	69.6	207.23	23.6	327.18	64.5	211.03
150 — 199	17.7	326.98	68.5	223.98	14.4	373.90	62.9	235.81
200 — 249	10.3	364.51	67.0	244.22	11.0	401.80	61.4	246.71
250 — 299	6.5	374.98	66.8	250.49	7.8	422.61	59.7	252.30
300 — 399	5.5	406.25	64.7	262.84	8.4	525.52	56.2	295.34
400 — 499	3.3	434.62	63.7	276.85	6.0	683.91	50.3	344.01
500 — 699	2.2	452.07	63.1	285.26	5.4	719.28	48.1	345.97
700 — 899	0.7	559.85	56.6	316.88	3.2	1009.43	41.1	414.88
900—above	0.7	565.82	61.3	346.85	3.5	1201.66	37.3	448.22

Sources : Col. 1 and 5—Appendix Table VII.
Col. 2 and 6—Appendix Table XVIII.
Col. 3 and 7—[27].

TABLE XIV

CONSUMER EXPENDITURE ON FOOD AND RELATED ITEMS BY INCOME GROUP : JANUARY TO JUNE, 1965

(Taka/1966 prices)

Monthly Household income Groups (Taka)	Rural				Urban			
	Percent of Population	Annual Per Capita Consumer Expenditure	Percentage Distribution of Expenditure on Food and Related Items	Annual Per Capita Expenditure on Food and Related Items	Percent of Population	Annual Per Capita Consumer Expenditure	Percentage Distribution of Expenditure on Food and Related Items	Annual Per Capita Expenditure on food and Related Items
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Less than 50	2.8	254.81	70.8	180.41	0.7	530.22	63.3	335.63
50 — 99	24.6	292.22	73.6	215.08	13.6	285.26	61.6	175.72
100 — 149	26.8	340.73	73.3	249.76	16.8	348.03	59.3	206.38
150 — 199	15.9	376.53	72.1	271.48	17.0	431.74	59.0	254.73
200 — 249	10.3	417.14	71.8	299.51	12.7	448.02	56.7	254.03
250 — 299	6.2	462.98	69.6	322.23	9.4	510.31	55.7	284.24
300 — 399	6.9	483.51	67.4	325.89	13.0	590.89	52.5	310.22
400 — 499	1.6	554.60	66.6	369.36	5.9	688.38	53.0	364.84
500 — 749	3.4	586.35	64.2	376.44	5.9	901.92	47.3	426.61
750 — 999	0.8	614.31	60.4	371.04	2.8	1245.55	44.9	559.25
1000 —1499	0.3	568.97	68.8	391.45	1.2	1270.02	47.1	598.19
1500 —1999	0.3	796.31	53.1	422.84	0.3	1394.45	22.8	317.93
2000 —above	0.1	1556.02	27.2	423.24	0.7	2157.35	33.2	716.23

Sources : Col. 1 and 5 — Appendix Table VII.
Col. 2 and 6 — Appendix Table XVIII.
Col. 3 and 7 — [27].

TABLE XV

CONSUMER EXPENDITURE ON FOOD AND RELATED ITEMS BY INCOME GROUP : APRIL-JUNE, 1966

(Taka/1966 prices)

Monthly Household Income Group (Taka)	Percent of Population (1)	Annual Per Capita Consumer Expenditure (2)	Percentage Distribution of Expenditure on Food and Related Items (3)	Annual Per Capita Expenditure for Food and Related Items (4)
Less than 50	0.7	159.84	66.0	105.49
50 — 99	14.8	285.01	69.8	198.94
100 — 149	22.2	320.39	68.9	220.75
150 — 199	15.7	381.33	67.2	256.25
200 — 249	10.9	430.92	68.2	293.89
250 — 299	9.1	459.39	61.4	282.07
300 — 399	8.5	472.83	61.6	291.26
400 — 499	7.3	645.61	58.4	377.04
500 — 749	6.6	925.94	46.3	428.71
750 — 999	2.1	683.44	54.7	373.84
1000 —1499	1.3	1635.04	42.1	688.35
1500 —1999	0.8	1237.33	39.0	482.56
2000—above				

Sources : Col. 1—Appendix Table VII.

Col. 2 —Appendix Table XVIII.

Col. 3 — [27].

TABLE XVI

CONSUMER EXPENDITURE ON FOOD AND RELATED ITEMS BY INCOME GROUP, 1966/67

(Taka/1966 prices)

Monthly Household Income Groups (Taka)	Rural				Urban			
	Percent of Population	Annual Per Capita Consumer Expenditure	Percentage Distribution of Expenditure on Food and Related Items	Annual Per Capita Expenditure on Food and Related Items	Percent of Population	Annual Per Capita Consumer Expenditure	Percentage Distribution of Expenditure on Food and Related Items	Annual Per Capita Expenditure on Food and Related Items
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Less than 50	1.3	257.48	70.3	181.01	0.4	302.07	73.8	222.93
50 — 99	26.0	259.47	76.2	197.72	12.2	284.92	71.3	203.15
100 — 149	23.9	317.27	75.3	238.90	22.3	341.36	70.5	240.66
150 — 199	17.5	349.18	74.8	261.19	15.5	397.46	67.6	268.68
200 — 249	11.5	388.76	73.7	286.52	12.3	419.40	66.2	277.64
250 — 299	7.3	420.98	71.9	302.68	9.0	462.91	64.1	296.73
300 — 399	6.1	453.48	71.5	324.24	11.6	530.75	62.0	329.07
400 — 499	2.6	517.54	69.0	357.10	6.1	589.33	58.8	346.53
500 — 749	2.6	576.89	69.4	400.36	5.1	803.34	53.3	428.18
750 — 999	0.6	659.24	66.3	437.08	2.2	979.82	51.1	500.69
1000 —1499	0.6	762.45	61.2	466.62	2.3	1250.36	48.2	602.67
1500 —1999					0.6	1403.82	41.0	575.57
2000—above					0.4	1871.05	46.7	873.78

Sources : Col. 1 and 3 — Appendix Table VII.
Col. 2 and 6 — Appendix Table XVIII.
Col. 3 and 7 — [27].

TABLE XVII

CONSUMER EXPENDITURE ON FOOD AND RELATED ITEMS BY INCOME GROUP : 1968/69

(Taka/1966 prices)

Monthly Household Income Groups (Taka)	Rural				Urban			
	Percent of Populaion	Annual Per Capita Expenditure on Food-grains (rice & wheat)	Col. 2 as % of Total Expenditure on Food & Related Items in 1966/67	Annual Per Capita Total Expenditure on Food and Related Items	Percent of Population	Annual Per Capita Expenditure on Food-grains (rice & wheat)	Col. 6 as % of Total Expenditure on Food & Related Items in 1966/67	Annual Per Capita Total Expenditure on Food and Related Items
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Less than 50	0.7	130.24	68.3	190.68	0.1	168.54	67.4	250.06
50— 99	21.7	122.46	67.4	181.68	7.2	138.00	59.9	230.38
100— 149	27.6	149.13	67.1	222.25	19.8	139.41	55.1	253.01
150— 199	21.3	160.17	65.2	245.66	20.0	143.76	52.9	271.76
200— 249	12.7	166.14	64.7	256.79	15.3	145.17	53.5	271.35
250— 299	6.9	173.37	63.9	271.31	10.1	153.06	49.7	307.97
300— 399	5.9	171.87	62.7	274.11	10.7	146.58	46.1	317.96
400— 499	1.6	192.69	60.9	316.40	5.6	149.85	45.4	330.07
500— 749	1.2	188.49	57.0	330.08	5.7	157.92	40.5	389.93
750— 999	0.2	181.10	58.8	307.99	2.7	145.59	31.2	466.63
1000—1499	0.2	212.76	57.2	371.96	2.1	140.67	28.5	493.58
1500—1999					0.4	134.01	31.2	429.52
2000—above					0.3	162.78	22.6	720.27

Note : For this year Quarterly Survey data on physical quantity of rice and wheat consumption were available. Figures in Col. 2 were obtained by multiplying the quantity figures for rice and wheat by the retail price of coarse rice and rationed wheat respectively and adding the two. Col. 3 figures were taken from [27]. Percentages in Col. 3 were used for blowing up the figures in Col. 2 and obtain figures in Col. 4.

TABLE XVIII

MINIMUM REQUIRED CONSUMPTION PER CAPITA IN BANGLADESH

Commodity	Urban					Rural	
	Average Requirement Per Person Per Day (gram)	Calories	Protein (gram)	Price Per Kg. (Tk./1966 prices)	Value of Required Diet Per Annum (Tk. 1966 prices)	Price Per Kg. (Tk./1966 prices)	Value of Required Diet Per Annum (Tk. 1966 prices)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rice (coarse)	397	1386	26.20	0.89	128.48	0.80 (10)	115.63
Wheat (rationed)	40	139	4.40	0.43	6.28	0.43 (0)	6.28
Potato (desi, nainital, medium)	27	26	0.43	0.68	6.70	0.58 (15)	5.50
Sugar/Gur	20	82		1.08	7.88	1.03 (5)	7.51
Pulses (masoor)	40	153	10.04	1.04	15.18	0.97 (7)	14.16
Vegetable (brinjal)	150	36	2.10	0.47	25.73	0.31 (35)	16.97
Fish (chingri)	48	51	9.94	2.44	42.75	1.83 (25)	32.06
Meat (beef)	12	14	2.71	2.27	9.94	2.27 (0)	9.94
Milk (cow)	58	39	1.86	0.79	16.72	0.52 (35)	11.01
Fats and Oils (mustard)	20	180		4.06	29.64	3.65 (10)	26.65
Fruits (banana)	20	6		1.08	8.62	0.86 (20)	6.28
Total		2112	57.68		297.92		251.99

TABLE XVIII (Contd.)

Notes :

1. Figures within parentheses represent the percentage difference between urban and rural prices.

2. The total number of calories and the amount of protein contained in the above consumption bundle was described as "adequate daily intake" in a study on Sri Lanka [50, p. 9]. The per capita daily recommended allowance for Sri Lanka in terms of number of calories was actually 2200 [50, p. 21]. Considering the difference in climatic condition and per capita income level between Sri Lanka and Bangladesh, the minimum caloric requirement for Bangladesh was taken to be 2100, a figure quoted above.

3. Average requirement was worked out on the basis of three considerations. (i) Amount of major food items as recommended by nutrition experts and quoted in [31, p. 95]. This consumption bundle was apparently arrived at by taking into account the physical requirments for nutrients such as calories, proteins, vitamins, fats, iron, calcium, niacin etc. However, the emphasis was placed here on calory and protein requirements alone. (ii) Consumer preferences as revealed by the various quarterly surveys [27] in the rural and urban areas of Bangladesh. (iii) Supply possibility of the implicit total requirement.

4. Rural prices were obtained by reducing the urban prices in Col. 3 (which represent the average retail prices observed in major urban centres of Bangladesh) by different margins as indicated within parentheses of Col. 6. These margins were derived from the figures on price spread between farm yard prices and prices in secondary markets for a number of commodities as given in [22]. The figures quoted in [22] were adjusted to make allowance for the fact that the rural population bought a portion of its requirement at the market thus reducing the price spread imputable to various items of consumption as listed above.

Sources:

1. Calory and protein equivalent of food items—[40; 47; 50].
2. Urban prices — [21].

TABLE XIX

PER CAPITA ANNUAL EXPENDITURE ON FOOD AND RELATED ITEMS IN RURAL AND URBAN LABOUR HOUSEHOLDS IN BANGLADESH

(Taka/1966 prices)

Year	Rural		Urban	
	D. A.	B. S.	Helper in Construction	All Unskilled Workers
1949	236			
1950	227			
1951	186			
1952	192			
1953	176			
1954	n. a.			
1955	216			
1956	n. a.			
1957	193			
1958	215		260	
1959	218		263	
1960	216		266	
1961	249		304	
1962	240	236	330	276
1963	258	261	360	301
1964	289	264	374	304
1965	246	261	348	303
1966	212	247	321	288
1967	246	276	318	290
1968	241	263	328	294
1969	284	261	299	305
1970	258	257	311	300
1971	215	209	248	275
1972	203	132	170	170
1973	197	151	170	159

Notes:

(1) Of the real wage earnings of labourers in rural and urban areas as given in Tables IV and V it was assumed that the entire amount was consumed. The proportions of total expenditure assigned to food and related items were 72% for rural areas and 68% for urban areas. These figures were derived from the trend shown in quarterly consumer surveys for the monthly household income groups of less than Tk. 100.

(2) On the basis of the data on family size as given in the quarterly surveys, the average family size in the rural and urban labour households was assumed to be 3.5 and 3 respectively. From similar evidence the number of earners per family was assumed to be 1.1. The figures arrived at by this method were again raised by 50% in the case of rural areas and 25% in the case of urban areas, to take account of the fact that wage earnings represent only a part (though the most important part) of the total income of a labour household.

TABLE XX

BANGLADESH POPULATION, 1949/50 TO 1969/70

(Figures in million)

Year	Population		Rural		Urban		Agricultural	
	Present Study (1)	Bose's Study (2)	Present Study (3)	Bose's Study (4)	Present Study (5)	Bose's Study (6)	Present Study (7)	Bose's Study (8)
1949/50	42.25	42.25	40.42	40.42	1.83	1.83	35.43	35.43
1950/51	43.29	43.29	41.41	41.41	1.88	1.88	36.37	36.37
1951/52	44.36	44.35	42.40	42.39	1.96	1.96	37.33	37.33
1952/53	45.45	45.44	43.40	43.40	2.05	2.04	38.32	38.32
1953/54	46.57	46.56	44.44	44.43	2.13	2.13	39.34	39.34
1954/55	47.72	47.70	45.50	45.48	2.22	2.22	40.38	40.38
1955/56	48.90	48.86	46.58	46.55	2.32	2.31	41.45	41.45
1956/57	50.10	50.06	47.68	47.65	2.42	2.41	42.55	42.55
1957/58	51.34	51.29	48.82	48.77	2.52	2.52	43.68	43.68
1958/59	52.60	52.56	49.94	49.94	2.63	2.62	44.84	44.84
1959/60	53.90	53.85	51.15	51.11	2.75	2.74	46.02	46.02
1960/61	55.60	55.25	52.78	52.38	2.86	2.87	47.52	47.22
1961/62	57.30	56.69	54.36	53.70	2.94	2.99	48.71	48.45
1962/63	59.10	58.16	55.52	55.06	3.58	3.12	50.03	49.70
1963/64	60.90	59.67	56.94	56.42	3.96	3.25	51.26	50.99
1964/65	62.80	61.22	58.41	57.83	4.39	3.39	52.63	52.04
1965/66	64.60	62.81	59.92	59.27	4.68	3.69	53.99	53.39
1966/67	66.50	64.44	61.17	60.59	5.33	3.85	55.10	54.77
1967/68	68.40	66.12	62.64	62.11	5.76	4.01	56.43	56.20
1968/69	70.40	67.84	64.18	63.65	6.22	4.19	57.82	57.66
1969/70	72.40	69.60	65.73	65.23	6.67	4.37	59.21	59.16

Source : [3].

Labour Force Status and Fertility

by

RAFIQUL HUDA CHAUDHURY*

INTRODUCTION

There has been considerable interest among some population scientists to look for measures beyond single factor family planning approach for limiting high fertility levels in developing countries [1; 2; 7; 12]. In order to reduce fertility, some of the proponents of beyond family planning measures emphasize the importance of adopting policies related to opportunities for activities for females other than those involving domestic works [1 ; 12].

In this context an attempt is made here to examine the relationship between female labour force participation and fertility. Female labour force participation has been classified into two groups: (i) non-agricultural and (ii) agricultural. We have also examined the relationship between female participation in household work (economically inactive) and fertility. The purpose of examining the relationship between female labour force participation and fertility lies in the fact that though the negative relationship between these two variables has been confirmed in the industrialized world [1; 15; 19; 24], previous research focussing on less developed countries point to no such uniform pattern [8; 10; 11; 14]. Similarly, little research has been conducted concerning the impact of unpaid family workers (domestic workers) upon fertility. This study, therefore, will provide us an opportunity to examine the above relationships in the context of a developing country like Bangladesh.

---

*The author is a Research Demographer at the Bangladesh Institute of Development Studies. He wishes to express his gratitude to Dr. Warren C. Robinson and Dr. Ansley J. Coale, Professors of Economics of Pennsylvania State University and Princeton University, USA, respectively for their comments on an earlier draft of the paper. The author is thankful to his colleagues at the Institute particularly to Dr. Mohiuddin Alamgir and Dr. A. Ghafur for their comments and for editing of the manuscript. He also acknowledges his thanks to Dr. Lincoln C. Chen, Staff Associate of the Population Council, USA and Dr. Stanislaus D'Souza, an Assistant Professor of Bio-Statistics of the Johns Hopkins University, USA for their critical but very helpful comments on the paper. Miss Sharifa Begum and Mr. Reaz Mohammad Talukder deserve appreciation for assisting the author in compilation of the data.

DATA AND METHODOLOGY

Source of Data

The study is limited to the conterminous area of Bangladesh and employs data provided by the 1961 national Census. In this study, subdivisions[1] constitute the unit of analysis. There were 59 such subdivisions in Bangladesh in 1961.

Dependent Variable

Fertility is the dependent variable in this study. The ratio of children 0—4 years of age to women in the age group 15—49 has been selected as the index of fertility. This ratio is commonly known as the child-woman ratio (CWR). Two types of this ratio are calculated: unadjusted and adjusted. The unadjusted ratios are those computed directly from the census. The adjusted ratios assumed a sex-ratio of 107 for the children 0—4, the adjustment being for suspected under-enumeration of children under age 4 [13].

There are several deficiencies in using child-woman ratio as a measure of fertility, particularly when one studies differential fertility. First, the ratio may be affected by an under-enumeration of young children from one area to another. The child-woman ratio, therefore, may vary from one region to another merely on the basis of differential completeness of the enumeration. To find out whether there is differential under-enumeration of children aged 0—4, we have examined the sex-ratio of the above age-group for all the regions under study. The analysis reveals the national sex-ratio for the population 0—4 age-group as 97.8 and this ratio varies from one region to the other, ranging from 94 to 101 with maximum clustering around 98, 97 and 96 [5]. These figures therefore, suggest male under-count[2] in the age-group 0—4 and also variation in this under-count. To account for this male under-count and differential under-enumeration, we have introduced

---

[1] A subdivision in Bangladesh refers to an administrative unit.

[2] The countries where age data are reliable, the sex-ratio of children under 5 is usually found above 100 which implies that there are more male children under age 5 than female. If we take the above figures as standard, we would presume that sex-ratio of population aged 0-4 below 100 as an indicator of under-count of male children.

a correction factor by applying a uniform sex-ratio i.e., 107[1] for the population aged 0—4 across all the units of analysis. Second, the child-woman ratio may vary also from one region to another due to differential age composition of women in the reproductive years. The broad age-range (15—49) used in the denominator to compute the ratio does not take into account the age-distribution of women within this range. Fertility is, of course, closely related to age. Age-specific birth rates are highest in the age-group 20-39, the ratios using children under 5, therefore, would be expected to be at their maximum at about ages 22.5 to 32. 5. Thompson showed that ratio of children under age 5 per thousand women 20-44 years of age tended to be higher for American cities having larger proportions of woman 20—34 among those 20 to 44 years old [22]. In order to avoid this bias, we have examined the age distribution of women in the age-group 20—34 in each subdivision and no significant variation was found. In other words, the proportion of women in the age-group 20 –34 is essentially the same across all subdivisions of Bangladesh. Third,the child-woman ratio may vary also from one region to another due to differential infant and child mortality. In this study, we could not adjust for differential infant/child mortality because we have no knowledge even at rudimentary level of the pattern of mortality for the children under 5 by subdivisions of Bangladesh. To what extent our estimate of child-woman ratio is biased for not taking account of differential infant child mortality can only be answered by future researchers when the level of mortality under age 5 by subdivisions of Bangladesh is known. Fourth, differential child-woman ratio may also arise if mother maintains a separate subdivision residence from her child. But this problem is probably negligible in this case of a traditional society like Bangladesh where a mother could hardly be expected to live behind her child unless it is purely an exceptional case. It should also be pointed out here that our use of child-woman ratio as the measure of fertility is primarily dictated by the fact that we have no other better index of fertility at the subdivision level.

Independent Variables

The following independent variables are used in the present study : (i) percent of female population engaged in labour force; (ii) percent of female population

---

[1] A recent study on the sex-ratio has shown that a suitably adjusted value for the sex-ratio in the age interval 0—4 is in fact 1.066 for former East Pakistan (Bangladesh) [17].

employed in non-agricultural activities; (iii) percent of female employed as cultivators and other agriculturists; (iv) percent of female population engaged in household work only. The above percentages are calculated by dividing the absolute number of persons employed in a given activity by the appropriate total population. For example, percent of female population employed in non-agricultural activities was calculated by simply dividing the absolute number of females employed for non-agricultural activities by the total female population. As regards the reliability and comprehensiveness of these independent variables, we make the following observations. The data on women participation in non-agricultural activities in the census of 1961 is reported to be reliable [4] but the data on non-agricultural activities are not very comprehensive as one would like to have since it lacks specifics of non-agricultural activities i.e., how many women are in cottage handicrafts industries, sales, clerical, administrative, teaching, etc. upto subdivision levels. Information on these matters is necessary because the life style of a woman who is working as a labourer in cottage industry may be different from that of a woman who is working as a school teacher. The differential life styles may be differentially related to fertility and hence lumping them together may give us confounding relationship. Unfortunately, we have no check on this due to lack of data. The category female employed as cultivators and other agriculturists in the census of 1961 is believed to have included some un-paid family workers [4] in it. The probable inclusion of the un-paid family workers in the category of women participating in agricultural labour force was possibly caused by the way the information on labour force status was solicited. The screening question to ascertain labour force status in 1961 census was, "Are you working?" --without any reference to whether a person was self-supporting or not. In the absence of a probing question whether a person is self-supporting or not, it is likely to include in the working group the females who are simply assisting any members of the family even if they were not remunerated in cash or in kind [4]. It is also suspected that exceptionally high and exceptionally low female participation rate in agricultural labour force as observed in case of few subdivisions [6] may be due to differential inclusion of un-paid family workers in the category of female agricultural labour force [4]. Unpaid family workers are not usually considered as a part of the active labour force of a country. Moreover, unpaid family workers may be characteristically different from self-supporting working women. The probable inclusion of women who are not remunerated either in cash or in kind in the category of female agricultural labour force may somewhat suppress the true relationship between female labour force participation in agricultural activities and fertility. The data on women doing household work only can be considered reliable with the only exception that some of them may have been mis-classified as cultivators and other agriculturists.

Control Variable

To establish the net relationship of an independent variable on a dependent variable, we need to control for those variables which are related to both the independent and dependent variables of interest [21]. The above criterion is usually followed whenever a control variable is introduced in this study.

To determine the net effect of female labour force participation either in agricultural or non-agricultural activities, and female doing house-hold work only on fertility the following variables are brought under statistical control: (i) percent female educated fifth grade and above; (ii) percent urban and (iii) percent female currently married.

The procedures for calculation of the control variables are the same as that of the independent variables. The intercorrelation matrix among the variables employed in this study is provided in Appendix Table I and the zero-order correlations between the independent variables and fertility measues are shwon in Appendix Table II.

FINDINGS

A. Relationship of Percent of Female Population in Labour Force to Fertility

Table I presents zero-order and partial correlation between fertility for unadjusted and adjusted data and percent of female population in labour force for subdivisions in Bangladesh.

TABLE I

ZERO-ORDER AND PARTIAL CORRELATION COEFFICIENTS BETWEEN FERTILITY AS MEASURED BY CHILD-WOMAN RATIO (CWR) FOR UNADJUSTED AND ADJUSTED DATA AND PERCENT OF FEMALE POPULATION ENGAGED IN LABOUR FORCE FOR SUBDIVISIONS IN BANGLADESH, 1961

N=59

Independent Variable	Un-adjusted+ Child-woman Ratio		Adjusted ++ Child-woman Ratio	
	Zero-order Coefficient	Partial[1] Coefficient	Zero-order Coefficient	Partial[1] Coefficient
Percent Female Participation in Labour Force	—.397**	—.346**	—.431***	—.378**

+ Un-adjusted child-woman ratio refers to the ratio of children 0—4 years of age to women in the age-group 15-49.

++ Adjusted child-woman ratio assumes a sex ratio of 1.07 for the children 0-4, while the denominator is women in the age group 15—49.

[1] Partial Correlation is found out after allowance is made for the effect of the following variables: (i) Percent Female Educated Fifth Grade and Above; (ii) Percent Urban and (iii) Percent Female Currently Married.

**Significant at .01 level.
***Significant at .001 level.

Table I shows negative relationship between female labour force participation and fertility. This negative relationship holds true for both unadjusted and adjusted data and both at zero-order level and also when allowance is made for the effect of other independent variables. The relationship between female labour force participation and fertility is also found to be statistically significant at least at .01 level. We also find that fertility i.e., child-woman ratio of an area decreases on the average by—.182 and—.206 units per percent increase of female participation in labour force for unadjusted and adjusted data, respectively (see, Appendix Table III). The regression coefficients are also found to be statistically significant at least at .01 level. The above findings demonstrate the negative relationship between overall female labour force participation and fertility. We will now examine whether the above relationship between famale labour force participation and fertility also holds true when we decompose female labour force participation into non-agricultural and agricultural activities.

B. Relationship of Percent Female Population in Non-agricultural Activities to Fertility

Table II presents zero-order and partial correlation coefficients between percent of female population engaged in non-agricultural activities and fertility for unadjusted and adjusted data for subdivisions in Bangladesh.

TABLE II

ZERO-ORDER AND PARTIAL CORRELATION COEFFICIENTS BETWEEN FERTILITY AS MEASURED BY CHILD-WOMAN RATIO (CWR) FOR UN-ADJUSTED AND ADJUSTED DATA AND PERCENT OF POPULATION ENGAGED IN NON-AGRICULTURAL ACTIVITIES FOR SUBDIVISIONS IN BANGLADESH, 1961

N=59

Independent Variable	Un-adjusted+ Child-woman Ratio		Adjusted++ Child-woman Ratio	
	Zero-order Coefficient	Partial[1] Coefficient	Zero-order Coefficient	Partial[1] Coefficient
Percent Female in Non-Agricultural Activities	.103	.254	.067	.246

+Un-adjusted child-woman ratio refers to the ratio of Children 0—4 years of age to women in the age group 15—49.

++Adjusted child-woman ratio assumes a sex-ratio of 1.07 for the children 0—4, while the denominator is women in the age group 15—49.

[1] Partial Correlation is found out after allowance is made for the effect of the following variables: (i) Percent Female Educated Fifth Grade and Above; (ii) Percent Urban and (iii) Percent Female Currently Married.

Table II shows positive relationship between female labour force participation in non-agricultural activities and fertility. This positive relationship holds true for both un-adjusted and adjusted data and both at zero-order level and also when allowance is made for the effect of other independent variables. However, the relationship between female labour force participation in non-agricultural activities and fertility is not found to be statistically significant irrespective of the fact whether the above relationship is measured either by correlation or by regression coefficient [see, Tables II in the text and III in Appendix].

C. Relationship of Percent Female Population Engaged as Cultivators and Other Agriculturists to Fertility

Table III presents the zero-order and partial correlation coefficients between female participation in agricultural activities and fertility for un-adjusted and adjusted data for the subdivisions in Bangladesh.

TABLE III

ZERO-ORDER AND PARTIAL CORRELATION COEFFICIENTS BETWEEN FERTILITY AS MEASURED BY CHILD-WOMAN RATIO (CWR) FOR UN-ADJUSTED AND ADJUSTED DATA AND PERCENT OF FEMALE POPULATION EMPLOYED AS CULTIVATORS AND OTHER AGRICULTURISTS FOR SUBDIVISIONS IN BANGLADESH, 1961

N=59

Independent Variable	Un-adjusted+ Child-woman Ratio		Adjusted++ Child-woman Ratio	
	Zero-order Coefficient	Partial[1] Coefficient	Zero-order Coefficient	Partial[1] Coefficient
Percent Female Employed as Cultivators and Other Agriculturists	—.405**	—.347**	—.432***	—.385**

+Un-adjusted child-woman ratio refers to the ratio of children 0—4 years of age to women in the age group 15—49.

++Adjusted child-woman ratio assumes a sex ratio of 1.07 for the children 0—4, while the denominator is women in the age group 15—49.

[1] Partial Correlation is found out after allowance is made for the effect of the following variables: (i) Percent Female Educated Fifth Grade and Above; (ii) Percent Urban and (iii) Percent Female Currently Married.

*Significant at .01 level.

***Significant at .001 level.

Table III shows an inverse relationship between female participation in agricultural activities and fertility. This relationship holds true for both unadjusted and adjusted data. The relationship is somewhat attenuated when allowance is made for the effect of other independent variables but the pattern of relationship remains the same. The relationship between female participation in agricultural activities and fertility is found to be statistically significant at .01 level. We also find that fertility i.e., child-woman ratio of an area decreases on the average by —.185 and —.209 units per percent increase of female participation in agricultural activities for un-adjusted and adjusted data, respectively (see, Appendix Table III). The regression coefficients are also found to be statistically significant at .01 level. It may be further noted that the relationship between female participation in agricultural activities and fertility remains unchanged from what has been found above even if we exclude those subdivisions which have exceptionally high and exceptionally low female participation rate in agricultural activities from our analysis.[1]

After examination of Tables II and III we can say that of the two types (non-agricultural and agricultural) of female labour force participation, only the female participation in agricultural activities is associated with lower fertility for the country as a whole.

D. Test of Relationship between Female Doing Household Work only and Fertility

Table IV presents the zero-order and partial correlation coefficients between female population engaged in household work only and fertility.

---

[1] The correlation coefficients between female participation in agricultural activities and fertility are found to be—.462 and —.472 for un-adjusted and adjusted data respectively, when the outlyers are removed from the analysis. The coefficients are statistically significant at .01 level. The subdivisions removed from the analysis are as follows: Bogra, Natore, Serajganj, Pabna Sadar, Narail, Barisal Sadar (North), Barisal Sadar (South), Bhola, Patuakhali, Perojpur, Mymensingh (South), Dacca Sadar (South), Manikganj, Munshiganj, Madaripur, Gopalganj, Sunamganj, Habiganj, Brahmanbaria, Comilla Sadar (North), Comilla Sadar (South), Chandpur, Feni, Ramgar, Rangamati and Bandarban.

TABLE IV

ZERO-ORDER AND PARTIAL CORRELATION COEFFICIENT BETWEEN FERTILITY AS MEASURED BY CHILD-WOMAN RATIO (CWR) FOR UN-ADJUSTED AND ADJUSTED DATA AND PERCENT OF FEMALE POPULATION ENGAGED IN HOUSEHOLD WORK ONLY FOR SUBDIVISIONS IN BANGLADESH, 1961

N = 59

Independent Variable	Un-adjusted+ Child-woman Ratio		Adjusted++ Child-woman Ratio	
	Zero-order Coefficient	Partial[1] Coefficient	Zero-order Coefficient	Partial[1] Coefficient
Percent Female Engaged in Domestic Works	.359**	.299*	.338*	.282*

+Un-adjusted child-woman ratio refers to the ratio of children 0—4 years of age to women in the age group 15—49.

++Adjusted child-woman ratio assumes a sex-ratio of 1.07 for the children 0—4, while the denominator is women in the age-group 15—49.

[1] Partial Correlation is found out after allowance is made for the effect of following variables: (i) Percent Female Educated Fifth Grade and Above; (ii) Percent Urban and (iii) Percent Female Currently Married.

**Significant at .05 level.

*Significant at .01 level.

Table IV shows positive relationship between female engaged in domestic work only and fertility for both un-adjusted and adjusted series of data. The relationship is somewhat attenuated when allowance is made for the effect of other variables but the pattern of relationship remained the same. The above relationship is also found to be statistically significant at .05 level. Table III in Appendix shows that fertility of a community increases on the average by .167 and .162 units per percent increase of female participation in domestic work only for un-adjusted and adjusted data respectively. The regression coefficients are also found to be statistically significant at .05 level. The above findings suggest that the communities where a higher proportion of women are engaged in domestic works also have the higher fertility.

DISCUSSION

The analysis points out that types of female labour force participation is differentially related to fertility. Female participation in non-agricultural activities is found to be positively related to fertility but this relationship is not statistically significant. On the other hand, female participation in agricultural activities is found to be inversely related to fertility and also found to be statistically significant. Now, a question arises how does one reconcile this conflicting relationships between female labour force participation and fertility. One plausible explanation could be offered to resolve the dilemma. The reason for not finding any significant relationship between female participation in non-agricultural activities and fertility possibly lies in the minor share of non-agricultural activities in comparison to agricultural activities in the total female labour force participation. According to 1961 Census, of the total female labour force 8.4 percent constitutes non-agricultural actitivities, as opposed to 91.6 percent agricultural activities [6]. This differential participation is also evident when we compute the female labour force participation by type of activities in relation to total female population. Female participation in non-agricultural activities constitutes only 0.90 percent of total female population and the corresponding figure for agricultural activities is 9.8 percent [6]. The above figures demonstrate relatively higher weight for agricultural activities in comparison to non-agricultural activities in female labour force participation. Keeping these figures in mind, one can argue that the type of activity which draws the maximum female labour force participation will therefore have maximum bearing upon fertility and in this case, we will expect female labour force participation in agricultural activities to be more significantly related to fertility.

However, an important point should be mentioned here. Our finding shows an inverse relationship between female participation in agricultural activities and fertility. This finding left us wondering why should female participation in peasant agriculture result in lower fertility when the current theory regarding female labour force participation and fertility says it probably would not be there but will be in industry, or in the modern sector of the economy. The current theory regarding female participation in labour force and fertility postulates that mere female labour force participation will not *per se* result in lower fertility unless there is a greater incompatability between the roles of mother and worker [8; 9; 11; 25]. The incompatability between the roles of mother and worker is likely to be higher in big industrial cities and metropolis where women are engaged in modern sector of the economy and in these places the female participation in labour force will lead to lower fertility. In otherwords, the strength of the relationship between female labour force participation and fertility is posited to be directly correlated with modernization. But the above contention is not found to be true at least in the case of Bangladesh. For the country as a whole, we find that female participation in the traditional sector of the economy, i.e., in agricultural works is inversely related to fertility. The above relationship has emerged inspite of the fact that Bangladesh is far below in any scale of industrialization or modernization and where the incompatability between the roles of mother and worker is less likely to occur in rendering farm works by peasant women. Moreover, in Bangladesh, there is possibility of finding more parental surrogates which would further lead to less role conflict among the working women. The findings of inverse relationship between female labour force participation and fertility in the context of Bangladesh, therefore, suggests that given alternative roles to play even in the traditional sector of the economy other than those related to household work will result in lower fertility. Therefore, it becomes evident that the relationship between female labour force participation and lower fertility is not necessarily contingent upon modernization foctors as suggested by earlier studies.

The finding of positive association between female doing household work only and fertility points out that when women have no other alternatives other than performing household works only find no extra constraints to discharge their maternal roles and hence having more children are no disincentives for them.

In the preceding discussions, we have tried to suggest that female participation in labour force leads to lower fertility whereas female participation in unpaid family work leads to higher fertility. However, there are number of methodological problems involved in arriving at a conclusive evidence on the above issues. First, the analysis presented here is based on community level data which may lead to *ecological* fallacy [16] i.e., what is found at community level may not be true for every eligible individual in a community. To overcome this bias, we need information at individual level, i.e., micro-analysis. Surveys or panel studies may be necessary to discover the nature of interconnections between female labour force participation and fertility; female participation in unpaid family work (domestic work) and fertility. Second, the finding of an inverse relation between famale labour force participation and fertility and a positive relationship between female labour force participation in unpaid family work (domestic work only) and fertility may also arise through a process of selection which could be operating to remove the most fertile women from the labour force. To avoid this bias, we need to control for fecundity status of the labour force participating and non-participating women. Third, we don't know whether women have fewer children because they work or work because they have fewer children. We could not resolve the above issues in this study due to lack of data.

CONCLUSION

For the country as a whole, the data shows an inverse relationship between female labour force participation in agricultural activities and fertility. Female labour force participation in non-agricultural activities is found to have positive but insignificant relationship with fertility. The data suggests that female labour force participation in traditional sector of the economy, i.e., agricultural work may also lead to lower fertility. Female participation in domestic work only is found to be positively related to fertility.

Inspite of the limitations of data as mentioned earlier and without providing any conclusive direction of causation, we may venture into drawing some logical inferences from the findings of our analysis. From the findings of inverse relationship between female labour force participation and fertility and positive relationship between female participation in unpaid family work (domestic work) and fertility, we may infer that fertility of a community goes down when women are given some kind of alternative roles to play other than those related to domestic or familial works and the reverse is true when women have no other alternative roles to play other than those related to unpaid family works. The above findings have far-reaching policy implications. It suggests that the Government wishing to reduce the rate of population growth in Bangladesh should find means to provide alternative roles or opportunities for women other than those related to domestic work only.

REFERENCES

1. Blake, Judith, "Demographic Science and the Redirection of Population Policy", *Journal of Chronic Diseases*, 18 (1965), p. 1200.

2.————————"Are Babies Consumer Durables ? A Critique of the Economic Theory of Reproductive Motivation", *Population Studies*, Vol. 22, No. 1, Part 1, (March 1968), pp. 60-74.

3. Blalock ,Hubert M., *Social Statistics*, Mcgraw-Hill Book Company, New York, 1960, pp. 329-331.

4. Bean, Lee L. *et. al*, "The Labour Force of Pakistan : A Note on the 1961 Census", *The Pakistan Development Review*, Vol. VI, No. 4, (Winter 1966), pp. 587-591.

5. Census : *Pakistan Census*, 1961, *East Pakistan*, Vol. 2, (Karachi, Manager of Publications).

6.————: *Pakistan Census*, 1961, *Economic Characteristics*, Census Bulletin No. 5, (Karachi, Manager of Publications).

7. Davis, Kingsley, "Will Current Programs Succeed ?" *Science*, 158 (November 1967), pp. 730--739.

8. Gendell, M., *et. al.*, "Fertility and Economic Activity of Women in Guatemala City, 1964", *Demography*, Vol. 7, No. 3, (August 1970), pp. 273-286.

9. Goldstein, Sidney, "The Influence of Labour Force Participation and Education on Fertility in Thailand", *Population Studies*, Vol. 26, No. 3 (November 1972) pp. 419-435.

10. Heer, David and Elsa Turner, "Areal Differences in Latin American Fertility" *Population Studies*, Vol. 18. (March 1965), pp. 279-292.

11. Jaffe, A. J. and Azumi, K., "The Birth Rate and Cottage Industries in Underdeveloped Countries", *Economic Development and Cultural Change*, No, 9 (October 1960), pp. 52-63.

12. Kasarda, John, "Economic Structure and Fertility : A Comparative Analysis", *Demography*, Vol. 8, No. 3 (August 1971), pp. 307-317.

13. Krotki, Karol J., "Population Size, Growth and Age Distribution : Fourth Release from the 1961 Census of Pakistan", *The Pakistan Development Review*, Vol. III, No. 2, (Summer 1963), pp. 279-305.

14. Miro, Carmen and F. Rath, "Preliminary Findings of Comparative Fertility Surveys in Three Latin American Countries", *Milbank Memorial Fund Quarterly* , Vol. 43 No. 2 (April 1965), pp. 36-62.

15. Ridely, Jeanne, "Demographic Change and the Roles and Status of Women", *The Annals of the American Academy of Political and Social Science*, No. 375, 1968, pp. 15-25.

16. Robinson, W. S., "Ecological Correlations and the Behaviour of the Individuals", *American Journal of Sociology*, 63 : 607, 1958.

17. Rukanuddin, A. R., "A Study of the Sex-ratio in Pakistan", in Robinson, W. C., (ed.), *Studies in the Demography of Pakistan*, Pakistan Institute of Development Economics, 1967, pp. 147-224.

18. Sirageldin, Ismail, "The Survey Method in Family Planning Research and Evaluation : Review and a Proposal", A Paper presented at American Association for Public Opinion Research Conference, Atlantic City, USA, May 18-21, 1972.

19. Stycos, Mayone J., "Female Employment and Fertility in Lima, Peru" *Milbank Memorial Fund Quarterly.* Vol. 18, (January 1965), pp. 42–54.

20. ————and Robert Weller, "Female Working Roles and Fertility" *Demography*, Vol. 4, No. 1, 1967, pp. 120-127.

21. Suits, D. Morgan, J. N. and Sonquist, J, A., "Problems in the Analysis of Survey Data and a Proposal", *Journal of American Statistical Association*, Vol. 58, (June 1963), pp. 415-434.

22. Thompson Warren S., *Ratio of Children to Women, Census Monograph XI, US Bureau of the Census*, 1931.

23. Weeks, John R, "Fertility and Family Structure : The Chilean Case" Paper Read at the Pacific Sociological Association Meeting, 1967.

24. Weller, Robert, "The Employment of Wives, Dominance and Fertility" *Journal of Marriage and the Family*, 30, (August 1968), pp. 437-442.

25. —————"The Employment of Wives, Role Incompatibility and Fertility", *Milbank Memorial Fund Quarterly*, 46 (October 1968), pp. 507-526.

Appendix

TABLE I

CORRELATION MATRIX AMONG THE INDEPENDENT VARIABLES

Independent Variables	1	2	3	4	5	6
1. % Female Educated Fifth Grade & Above	1	.745	—.221	.288	—.193	.125
2. % Urban		1	—.118	.391	—.103	.063
3. % Female Currently Married			1	—.349	—.167	.187
4. % Female in Non-agricultural Activities				1	—.118	.055
5. % Female Cultivators and Other Agriculturists					1	—.980
6. % Female Engaged in Domestic Works						1

TABLE II

ZERO-ORDER CORRELATION BETWEEN FERTILITY AS MEASURED BY CHILD-WOMAN RATIO (CWR) AND FOUR MEASURES OF LABOUR FORCE STATUS : BETWEEN FERTILITY AND INDICES OF URBANIZATION AND EDUCATION AND BETWEEN FERTILITY AND PROPORTION MARRIED FOR SUBDIVISIONS IN BANGLADESH

N=59

Independent Variables	Fertility (CWR)	
	Un-adjusted	Adjusted
X_1 % Female Educated Fifth Grade and Above	.063	.054
X_2 % Urban	.008	—.010
X_3 % Female Currently Married	.248	.296*
X_4 % Female in Labour Force	—.397**	—.431***
X_5 % Female in Non-agricultural Activities	.103	.067
X_6 % Female Cultivators and Other Agriculturists	—.405**	—.432***
X_7 % Female Engaged in Domestic Works	.359*	.338***

*Significant at .05 level.

**Significant at .01 level.

***Significant at .001 level.

TABLE III

REGRESSION COEFFICIENTS OF THE MEASURES OF LABOUR FORCE STATUS TO FERTILITY (CWR)

Measures of Labour Force	Fertility (CWR)	
	Un-adjusted	Adjusted
% Female in Labour Force	—.182** (.057)	—.206*** (.058)
% Female in Non-agricultural Activities	1.11 (1.42)	.767 (1.40)
% Female Cultivators and Other Agriculturists	—.185** (.055)	—.209*** (.057)
% Female Engaged in Domestic Work Only	.167** (.057)	.162** (.059)

Figures in parentheses refer to standard deviation of the regression coefficient.

**Significant at .01 level.

***Significant at .001 level.

Brief Reflections on the Central Issues of Policy in Bangladesh

by

Gustav Ranis*

It is assumed that the reader is familiar with the general features of the Bangladesh economy. Let me only add, for openers, that while recognizing the deep difficulties currently besetting the system—including the recent severe floods—I do not share the general sense of despondency, if not despair, concerning the prospects for the future. There are enough things, I am firmly convinced, within the control of the decision-makers of Bangladesh to convert present stagnation into satisfactory—though by no means spectacular—forward motion.

I. OBJECTIVES AND MEANS

A fundamental issue which determines the constraints under which Bangalee policy-makers have to labor and from which much else flows relates to the question of societal means and objectives. There appears to be something approaching a consensus on the essential elements, namely "shared and self-reliant development", i. e., the creation of a more equitable society consistent with growth at home and non interference from abroad. These are, to my mind, the basic objectives of this society; they are also equivalent to the basic objectives of any truly socialist society.

The fundamental next question that needs, we think, to be probed, candidly and forthrightly, is whether or not the government is also committed to any particular means for achieving these socialist ends—or whether it is prepared to be quite pragmatic with respect to the means.

This question, of course, needs to be responded to in the context of the options available. Mainland China has opted for well-known centralized socialist means

---

*Professor of Economics ; Director, Economic Growth Center, Yale University.

to achieve socialist objectives. Some East European countries have opted for a more pragmatic package including centralized socialist tools in combination with the selective use of the market mechanism in pursuit of socialist objectives. The Western countries have used another pragmatic package, the more extensive use of the market mechanism combined with the more selective use of direct government interventions to achieve their own capitalist objectives.

As for the case of Bangladesh, if a massive effort of the Chinese variety, driven by committed cadres and sustained discipline at all levels, were selected, no one would deny that it could be made to work. But it would clearly require such drastic changes in the social, cultural and political fabric that few would consider it likely at this point. That is not to say that continued inaction along the present track of substantial stagnation and drift might not render it feasible and acceptable to the society at some point in the not-too-distant future. Alternatively, if pragmatism as to means is possible, i. e., the means are not doctrinally constrained, Bangladesh can select a mix between market tools and government ownership and intervention which suits its particular human resource capacities at this point in time. Here one would make the obvious—but nevertheless important—point that the major current shortage is not land or capital or even foreign exchange (as short as these are) but central government administrative, technical and managerial capacity; and that the major plentiful resource is people, not just in terms of an unlimited supply of cheap labor, or brawn, but also in terms of brains, the desire, the conceptualizing and entrepreneurial capacities, of a substantial minority of Bangalees. If this is so, the logical, pragmatic mix of the use of the market and of government intervention is one which assiduously preserves the scarce resources of the talented—but altogether too few—officials in Dacca for the all-important task of framing the "right" policies and establishing the "right" environment to help harness this large reservior of disperesed humanity for purposes of pursuing the started socialist goals of Bangladesh, i.e., "shared and self-reliant development'.

I shall, in all that follows, make two critical assumptions: One, that the socialist goal expressed above, i. e., shared self reliant development, is, in fact, the basic objective of those in whose hands the destiny of Bangladesh has been entrusted; and two, that there is a disposition now, perhaps more so than a year or two ago, to be pragmatic, in terms of our discussion above, as to the means, but firm on achieving these ends. If either of these assumptions is invalid, i. e., the leadership either doesn't really "mean it" when it states these objectives, or is still dogmatically committed to a particular way of getting there, much of what I will have to say below will not hold. On the other hand, if these assumptions do hold, a substantially positive vision of what is possible opens itself, atleast to this observer. In Section II I will try to present the main ingredients of that vision, i.e., what is potentially achievable in Bangladesh, starting from the situation encountered in the summer of 1974, and including the basic outlines of the general strategy which underlines achievement of that vision. In section III I intend to present specific suggestions with respect to implementing the strategy in as much detail as possible. Finally, Section IV is devoted to some general reflections on Bangladesh development and its prospects in historical perspective.

II. A VISION OF BANGLADESH'S POTENTIAL: THE DIMENSIONS OF A BASIC TWO-PRONGED DEVELOPMENT STRATEGY

It has been said too many times—but still perhaps not often enough understood—that Bangladesh is a rural economy. The basic, essential blade of our proposed two-pronged strategy must therefore be directed towards a thoroughgoing mobilization of the rural areas through a balanced and domestically oriented growth. Bangladesh's large and rapidly growing population must, to the extent possible, be held productively in the rural areas, both in agriculture itself and in non-agricultural rural activities.

The second and complementary blade, if of substantially lesser importance, is related to the export sector, i. e., focussing on the better utilization of traditional exports, augmented by the gradual shift towards natural resource based non-traditional exports as well as labor intensive non-traditional exports, after some time. While both blades of this strategy are ultimately essential to reaching the position we think Bangladesh is capable of, it is important to emphasize once again that the second blade, which is tantamount to improving the performance of the export oriented enclave, should not be permitted to mesmerize the attention of policy-makers, as it is now doing and has done in the past. The transcendental importance of emphasizing rural mobilization as the *sine qua non* of reaching Bangladesh's objectives cannot be overemphasized. More than lip service, but a thorough going rural orientation by decision makers, is required if present stagnation trends are to be reversed.

Let me proceed then to the basic elements of the vision towards which Bangladesh can aspire over the coming years. With respect to rural mobilization we should recognize at least four major elements. One, continued increase in the productivity of the major food crops; two, increased activity in secondary crops in the rural areas; three, a spurt in agricultural processing; and four, rapid growth of small and medium-scale rural industry.

With respect to the essential ingredient of rural mobilization, i.e., continued productivity increase in the primary rice producing regions, we know that only perhaps ten percent of the potential area is today under high yielding varieties. We also know that rice yields are still only one-third those of Japan[1]. Moreover, we recognize that increases in output of sixty percent in the wake of the seed/fertilizer type of technology change, even if accompanied by increases of only thirty percent in employment can, nevertheless, if spread on a sustained basis to the traditional variety areas, provide the major and essential ingredient of any future rural mobilization effort. As the work of Mosharaff Hossain and of John Mellor, among others, indicates there thus exists a great potential for labor absorbing output increases in basic rice production.[2]

A second integral part of any rural mobilization effort resides in the substantial possibility of expanding secondary and multiple cropping patterns in many areas of Bangladesh, including vegetables, fruit, sunflower seed, soya, ground-nuts, winter wheat, edible oils, etc. These opportunities could not only yield major increments in rural employment and incomes, but also improve the dietary intake.

Third, there is a substantial potential for increased activity in agricultural processing, in the drying, milling, storing and marketing of both primary and secondary agricultural products; in vegetable and food canning for the domestic market; in poultry—which can often be done efficiently on a putting out system—

---

[1] FAO 1970 Production Yearbook.

[2] Employment generation, incidentally, is the one area in which the World Bank's recent General Economic Report is unaccountably pessimistic.

and even, in a limited area, in livestock and dairy products. Processing and associated services in the rural areas can be an important generator of employment and output as part of a balanced rural mobilization effort.

Finally, our rural vision includes the very substantial growth of the hitherto neglected area of rural industry. As in many other developing countries, Bangalee policy-makers and planners have, in the past, concentrated on aiding existing as well as new large scale industry, on the one hand, and on the preservation of "cottage industry", on the other. They have paid scant attention to the dynamic potential for the "excluded middle", i.e., small and medium scale industrial activities in the rural areas which require no special subsidization—unlike the two extremal types just referred to—but which are very likely to represent a viable and dynamic future growth potential in the rural areas. These include repair and machine shops, metal working, soap and coil production, furniture, sandals and and shoes, weaving, leather goods, the production of traditional handicrafts, bicycles, agricultural implements, pumps, tube wells, etc. Not only are the technologies in such rural industries likely to be efficiently labor intensive, but the growth of such activities will have an important feed-back on agricultural productivity in two senses: one, in the input-output sense, i. e., additional implements, pumps, etc. will make primary and secondary agricultural activities more feasible and efficient at their source; second, and even more importantly, in the incentives sense, i.e., the existence of additional investment opportunities in the rural areas will provide additional motivation for raising an agricultural surplus in the first place, to be channelized through the extended family, as well as through more complicated intermediation systems at a later point in time. Such linkages are especially important given the government's present limited capacity (or willingness) to tax agriculture.

The second and complementary part of our vision has to do with the improved management of the export oriented enclave, leading to the resumption of better growth performance in such traditional exports as jute, jute goods, matches, etc., but now complemented in an increasingly important way by such new industries as fertilizer growing up in tandem with the exploration of Bangladesh's natural gas resources. It foresees, after a somewhat longer interval, the spurt of non-traditional industrial exports based on Bangladesh's strong comparative advantage in unskilled labor supplies. Sustained activity in this latter area will have to await the development of a stronger industrial entrepreneurial capacity, which is somewhat down the road, but not as far as many people now suspect. Giving too short shift to small scale industrial entrepreneurial capacity in LDC's is analogous to our previous error in underestimating the wisdom and entrepreneurial capacity of LDC farmers.

III. IMPLEMENTING THE STRATEGY : HOW TO APPROACH THE VISION

It is generally agreed that virtually everything is scarce in Bangladesh, especially land, capital, foreign exchange, but, perhaps, most importantly, administrative and management capacity. What is plentiful is unskilled labor and, perhaps less generally recognized, a good deal of restless entrepreneurial striving among dispersed actors in both the rural and urban areas of Bangladesh.

Any effort in the direction of the achievement of the objectives stated must be orchestrated from Dacca. It will require sustained central government action, but it can't be run by Dacca. This must be fully understood if indeed pragmatism is to govern concerning the means to be employed to get us from here to there. The central government's function must be to help create the necessary infrastructure for action by millions of decision makers both in the public sector, i.e., local government officials, and in the private sector. Given the severe scarcity of administrative talent at the Center, a determined effort at decentralization is not only desirable from the substantive point of view (see below) but really inevitable if anything is to be accomplished. Any strategy which relies heavily on detailed across-the-board actions by Dacca—as at present—is doomed to failure from the beginning. In fact, if pragmatism is indeed to have any meaning it is precisely in terms of the useful choice by the central government of the key points of intervention, accompanied by a willingness to withdraw from controls of the horizontal (across-the-board) type not conducive to the mass mobilization of decision makers outside of the central government on whose dispersed actions so much depends. It is, however, essential to ensure the overall orchestration of the effort by Dacca in such a way as to provide the right environment and signals so that the millions of public and private sector actions required are, in fact, forthcoming and tending in the right direction. The general contours of such guidelines, i.e., the construction of the institutional and policy framework within which the societal objectives referred to can be met, in the context of our two pronged strategy, are considered in detail in what follows.

Let us first turn to the essential ingredients of a successful rural mobilization effort. We firmly believe that rural development is of one piece and should not be artificially segmented into attacks aimed at rice, at secondary crops, at processing industries, and other rural industrial activities. In other words, we believe that the integrated rural development program (IRDP) should be converted into just that, i.e., the bundle of activities and policies addressed to the needs of the **total rural sector.** This is the basic proposition which will be reflected in many of the specific suggestions which follow.

A. Balanced rural development requires, obviously enough, the creation of additional physical infrastructure, as well as the provision of inputs, credit and technology, both with regard to the agricultural and industrial activities of rural Bangladesh. Turning first to the creation of the rural infrastructure, i.e., the irrigation, market facilities, roads, etc., required for the generation of balanced dynamic growth, it seems to us that a basic precondition for the successful planning and implementation of such rural mini-infrastructure is an effective local government.

(1) Once viable local governments are in place at each level they should be charged with the establishment of plans and priorities at each level—with only technical and financial assistance from above.

(2) General guidelines for this activity should, moreover, be provided by the Planning Commission with respect to both the planning and implementation phases by means of a simple manual for project identification and evaluation. General guidance and supervision can be provided by the Ministry of Local Government.

(3) Early consideration should be given to a change in the fiscal pattern with respect to the financing of rural infrastructure. One suggestion would be to consider the provision of a fixed volume of funds on a per capita basis to each Union, to be matched either in kind or in takas by the local government. It is by now a well known fact that the resources available in each local area fot well understood priority projects are substantial. The proportions of central and local funds might be in the ratio of 1 to 9; later on it might even be possible, in the absence of an

overall land tax or presumptive income tax on land at the federal level, to move towards a "reverse revenue sharing" procedure by which most of the taxes are collected locally and some are passed on to the central government. At any rate, there should be fiscal incentives built into the matching funds procedure so that local government units which perform better than average would either be permitted to retain more of their locally collected revenues or receive a larger input from the Center.

(4) It would, incidentally, seem preferable to ask local communities not to budget separately for labor services to be contributed locally, while funds from above are used for "imported raw materials", since, as in foreign aid, this would tend to distort technologies and the mix of infrastructure against the use of local raw materials as well as labor. Projects which extend beyond the Union level and imply competition among various Unions would be negotiated at the Thana level; projects at the District level which are beyond the scope of local planning and approach the more traditional maxi or large scale infrastructure projects of the past, would continue to be handled as before, i. e., through the agencies of government operating from the Center. Rural electrification should be a high priority area for the future in this respect. Suggestions now current which imply that an executive officer in charge of coordinating horizontally the various arms of the Government providing ingredients for local planning, implementation, etc., be responsible to the Thana Council for his fitness reports should be given very careful consideration. The Thana Training and Development Centers (TTDC's) should be the focal point for such inter-action between the local government and the "fingers" of the Center. A revived rural works program, in other words, should be as truly decentralized as possible to afford maximum labor mobilization in directions which make maximum additional directly productive activities possible.

(5) Consideration might well be given to the possible early use of post B. A. student volunteers to assist Union and Thana Councils with both infrastructure plan preparation and execution, and the required coordination with the "fingers" of the central government. In spite of the considerable air of cynicism and disillusionment among the educated younger generation which a visitor is bound to perceive, there also remains evidence of much idealism and, even more relevant,

of unspent energy among a large number of university students which could be harnessed to a serious rural development effort. A volunteer program might be preferable to a national service corps which would run up against organizational limitations and the problems of inadequate preparation or commitment. But it is very important to try to capture those students who are motivated and who can become important prime movers and catalysts in the rural areas. Experience in other countries indicates that it might be wise to select volunteers to go back to those rural areas from which they have come to ensure better receptivity and better understanding of the problems.

(6) The establishment of infrastructure conducive to the encouragement of so called "growth centers" at the Thana level would constitute an important ingradient of our proposed balanced rural development pattern, and especially essential to the sustained growth of rural industry. Market and storage facilities, industrial estates, etc. may be part of the necessary overheads which could be planned by the local government structure and provided with technical assistance when asked for, from above. Such technical help, incidentally, given the scarce resources available in the country as a whole, might best be made available from pools at the District level or above, and composed of representatives of the various nation building departments.

(7) An early determination of whether or not a Japanese style land tax or presumptive income tax on land—perhaps partially retained and partially passed on upstairs (see above) —should be made. Such a tax could be levied on the value of land based on a rough capitalization of average base year harvests and adjusted every few years, thus permitting the generation of fiscal resources for the central government's infrastructural and other requirements, while not damaging producer incentives.

B. The provision of credit and physical inputs to the individual actors in the rural areas represents, of course, an essential complementary dimension of successful rural mobilization. It is, of course, easy to say that "there should be more of everything available to everyone"; but it is also a fact of life that both credit and physical inputs are likely to be scarce in Bangladesh for some time to come. Consequently most of the comments made below deal with the improvement of the system of allocation of these scarce inputs without which, even if infrastructural impediments were removed, the objectives of a balanced rural mobilization effort (which does not unduly favor the rural elite) could not be met. The following elements of a revised input strategy should therefore be carefully considered:

(1) The Government has already moved towards the more realistic pricing of physical inputs; however a large measure of subsidy remains with respect to most of the critical items, i.e., 97% for water, 25% for fertilizer, 50% for pesticides, etc. Myths die hard and perhaps the most hardy of myths is that the maintenance of low prices on scarce essential inputs assists the "little man." All the hard evidence is to the contrary, i.e., whenever a scarce input is subsidized and rationed, it is the large and more powerful claimants who wind up with the lion's share of the input and, of course, with the windfall profits resulting from the subsidy. In our view the Government should move as quickly as possible to full cost pricing on fertilizer, tube wells, pump sets, weeders, tillers, pesticides, etc. A number of important benefits would flow from such a move. first, and from the political point of view perhaps the most appealing, is that the government budget would be spared the heavy burden of substantial subsidies; second, with the more realistic pricing of raw materials and capital inputs,there would result a substantial decline in the current waste of water, pumps, and other capital which Bangladesh can ill afford—most important, the use of labor both in the overheads and in the directly productive activities in the rural areas would be encouraged rather than as is currently the case, discouraged; third, there would be an enhancement of equity as between the large and small farmer, with the small farmer much better off having access at a reasonable price than, without such access, having to buy in the black market; fourth, more realistic input prices would lead to a diminution of the smuggling of inputs out of the country; and fifth, higher fertilizer prices should help, if only marginally, in readjusting the currently unfavorable jute to rice price ratio which has seriously hurt Bangladesh's jute production.

(2) Another input, somewhat different in nature, the substantial subsidy on which should also be gradually diminished, is that of credit. Here the myth dies hardest, i.e., higher interest rates are almost always considered anti-social and directed against the small borrower. In fact, the actual situation around the developing world is just the reverse. Wherever credit is subsidized and therefore directly allocated, it is the large borrowers with good connections and good

signatures who get the subsidized credit. It is the small borrower who under such circumstances has to borrow in unofficial markets at extremely high rates. A substantial increase in the official rate of interest would therefore be of great advantage to the small borrower since he would now have a chance to stay in the market for official credit while windfall profits are removed from the large would-be borrowers.

It should be noted that in Bangladesh only 14% of total credit is in the form of official or institutional credit, which gives an indication of what kinds of rates most small farmers or rural industrialists, who have to borrow from relatives or rural money lenders, must be up against. It is also important to note that when credit is subsidized default rates are notably higher, since the whole transaction is viewed as a subsidy and not taken seriously. An AID rural credit review last year found that, across many LDC's, both the relative allocation of loans to large borrowers, and default rates among borrowers, were higher with lower, i.e., more heavily subsidized, interest rates. In Bangladesh as well some, admittedly partial evidence indicates that 65% of rural credit goes to cooperative management committee members, and 67% of defaults are incurred by the directors of such committees.

It is thus of extreme importance, both from the efficiency and the equity points of view, that interest rates be raised by means of an across-the-board monetary reform. In addition, it would be desirable to permit risk differentials to reflect themselves in differential rates at the upper end, and for the possibility of central bank reinsurance of outstanding full priced credit by the banking system to be explored.

Another very substantial bonus derived from such a monetary reform would be a to-be-anticipated substantial increase in the saving rate, especially in the rural areas. Even though the Bangladesh Central Bank rate has recently been moved upward slightly, a doubling of that rate would not be at all unrealistic given the present rates of inflation and the scarcity of credit in Bangladesh.

(3) In line with our basic concept of rural mobilization as essentially of one piece, we strongly urge an examination of the possibilities of pursuing a really integrated rural credit program, as contrasted with the alternative of having

different institutions handling agricultural and rural industrial credit and possibly further diversification with respect to short, long, and medium term credit. Given both the scarcity of human and administrative resources, plus the need to conserve plant and capital, we think it might be better to consider dividing the country up regionally and letting the cooperative banks and the ADB, as well as, where possible, the commercial banks, establish as many branch units as possible in different rural areas, with each offering undifferentiated (as to purpose) rural credit at realistic prices. This would not only save on banking infrastructure but also greatly simplify the lending operations which now try to differentiate between consumption and production loans, between rice, agricultural and non-agricultural rural purposes, and between working capital and other loans.

(4) A very important dimension of any successful balanced rural development effort is, as we pointed out earlier, the gradual spread of new goods, i.e., secondary agricultural goods and new industrial goods, in the rural areas as well as the spread of new adaptive or labor using technologies. While research into the area of adaptive goods and adaptive technology is an important ingradient, I believe that the first and easiest and, at the same time, the most productive contribution which can be made here is one of simply providing information on existing output and technology alternatives to all the rural population of Bangladesh.

(5) Again, in line with our emphasis on an integrated rural development effort, we would suggest that the Bangladesh Agricultural Development Corporation (BADC) possibly be converted into a Bangladesh Rural Development Corporation (BRDC) which would provide not only the agricultural inputs (as it does now) but also such needed imported components for small rural industry as cotton, key parts for domestically produced pumps and tubewells, etc. Alternatively, if this is viewed as impractical, either the banks or the Small Industries Corporation could be encouraged to establish new branch facilities in rural Bangladesh, providing a small foreign exchange component along with the domestic credit. Another possibility, given the fact that small rural industrialists connot be expected to obtain individual import licenses, is that the Small Industries Corporation, or the BRDC, gets an allocation, for example, for imported cotton and sells it (at full price) to small rural industrialists. Similarly for other key commodities. It should, however, be noted that much of the burgeoning rural industrial activity contemplated will require no or only very minimal amounts of foreign exchange.

(6) Finally, if and when a dynamic balanced rural development effort gets under way, the danger of premature and indiscriminate mechanization—a lesson from other countries—should be guarded against by maintaining a realistic high price on such items as tillers, weeders and tractors both in terms of domestic and tariff policy. However, we are aware that selective mechanization in agriculture, as well as capital intensity in selected areas of industry, may well be necessary for the overall enhancement of the productivity of the system's scarcest resources. We should thus be quite content not to bias matters **against** the use of capital, but to let the chips fall as they may once the biases **in favour** of the excessive use of such scarce resources are removed.

There are those who will say that this rural mobilization effort will, in fact, not adequately address the problem of the really marginal population in the rural areas, i.e., the really small farmers and landless labourers who, according to inadequate estimates, make up between 30% and 50% of the total rural population. It is argued that, as rural growth proceeds and land acquisitions take place, additional small farmers will be dispossessed and the army of landless laborers will increase. As a consequence, the formation of unions of landless laborers and/or the establishment by law of such minority representation on local government or cooperative councils is being discussed.

Quite to the contrary, we believe that the package outlined above will, in fact, not only provide for rapid growth in the rural areas but yield an improved distribution of income as well. This is true because the strategy suggested above is basically designed to mop up the unemployed and underemployed rural workers as quickly as possible. It is our fundamental assumption that the real bargaining power of the landless labourers and marginal farmers cannot be changed by the artificial insertion of union or other political gimmicks—supported by the government—but will change dependably only when the labor surplus condition is ended. But this is not a counsel for letting things get worse before they can get better. In fact, even before labor shortage displaces labor surplus an income redistribution in favor of the lower classes will result from the following consequences of our strategy. One, the windfall profits now being enjoyed by the large farmers from subsidies on credit, fertilizer, water, pumps, etc. will be diminished. Two, there will simultaneously result a substantial increase in demand for labor both as a consequence of the increased application of modern labor using technology in the primary crops, the expanding possibilities of employment in secondary crops, etc., but also in the new and burgeoning rural industries. Three, surplus owning landlords will themselves be less interested in buying more land, and thus dispossessing additional workers, and more in other investment opportunities off the land, especially in rural industries. Four, we can count on additional class mobility, as indicated in the instance of Taiwan, in the sense that many of the small farmers or landless agricultural laborers will themselves, once they have access to credit and information, move into rural services and or industries. Five, the expanded rural works program of the kind we have depicted should provide substantial additional demands for labor at the local level. Six, if all this is still inadequate—though I am inclined to doubt it—it may be politically expedient to provide for some small low end poverty program, for example, a limited subsidized credit window or a limited volume of subsidized fertilizer to the very small farmers or to the landless laborers who can resell it.

C. Turning now to the implementation of the second blade of our two pronged strategy, i.e., better management of the internationally oriented export sector, it is most important to recognize that Bangladesh has been hit harder than most other developing countries by the current global inflation especially concentrated in oil prices; while other LDC's have had at least some partial compensation via the high prices of some of their traditional exports, this has not been the case in Bangladesh. The only redeeming feature is that Bangladesh is a largely agricultural area and thus is less hurt by the higher price or lack of availability of industrial fuels; nevertheless, the related shortage of fertilizer and of fuel for the pump sets vital to the rural plans of Bangaldesh are likely to prove serious impediments to the achievement of agricultural production objectives. In order to ensure the recovery of Bangladesh's traditional exports, i.e., jute, tea, matches, paper, hides and skins, as well as to permit gradual diversification into non-traditional exports, both of the raw materials and of the labor-intensive industrial variety, the following directions of policy seem warranted:

(1) Given present rates of inflation in Bangladesh—largely induced by problems on the rural sector, i. e., rice shortages,—a measure of stabilization through wage goods' equilibrium clearly needs to be a high priority of government policy.

This requires serious reconsideration of the current "no tax on agriculture" policy plus a substantial restraint on deficit financing by the Government—all of which would be made easier if current input subsidy policies are withdrawn (see above). Successful agricultural mobilization of the kinds described earlier would contribute the single most important ingredient to achieving stabilization via the reduction of cost-push inflation in Bangladesh; in fact, in the absence of satisfactory performance by the rural sector the health of the enclave will continue to deteriorate.

(2) A second important ingredient is the gradual move towards a more realistic exchange rate, preferably via a *de jure* devaluation, but if that is, for one reason or another, politically difficult, a gradual move in that direction via *defacto* devaluation by means of higher than current import surcharges across the board (i.e., with less important exceptions), as well as an across the board export subsidy exempting only jute. A more realistic exchange rate would, of course, be preferable since subsidies and surcharges do not capture the capital account adequately. Moreover, the argument that an overvalued exchange rate matters less in Bangladesh because the export elasticities are low today misses the important point that any potential for new exports can never be exploited in this way.

(3) Special attention, I think, should be placed on economic relations with both India and Pakistan. Negotiations with India on jute and jute products should be carried forward. With Bangladesh exercising a relatively strong position in the field of high quality raw jute, she should be in a position to make a realistic bargain with India. Similarly, assuming no political obstacles, there should be no reason why an exchange with Pakistan, importing textiles and exporting such items as matches, paper, tea, as in earlier days, should not be reintroduced on a substantial scale. Attention should be focussed, moreover, on trade with other developing countries in the area, which will, for some time, provide a substantial potential for the as yet few exportable items of Bangladesh.

(4) One would expect import substitution policies to continue to be in effect in Bangladesh for some years to come. Nevertheless, we would suggest consideration of the gradual displacement of quantitative restrictions and licensing by equivalent tariffs, the level of which could ultimately (but not admittedly for some time) be shifted downward. One of the industries to be encouraged under this import substitution policy is fertilizer based on natural gas, one of Bangladesh's

prime and as yet unexploited natural resources. We strongly encourage, along the lines of John Lewis's earlier paper, a strong push on natural gas exploration with the help of foreign companies; however we feel that it is important to reiterate the point that even the successful exploration of natural gas, and the growth of an associated fertilizer complex, cannot carry the rest of the Bangladesh economy with it. At such a point the situation in Bangladesh would be more like that of Indonesia than that of Saudi Arabia. There is a danger that the backoning potential of natural gas could focus too many energies rather than providing an important assist to the basic task of mobilizing people, which remain the basic important resource of Bangladesh.

(5) With respect to the public sector enterprises which represent a large portion of the urban industrial enclave, we know of no easy solution to ensure greater efficiency in this sector over time. With the departure of the Pakistani managers and owners there was no alternative to the socialization under the aegis of government corporations. We do, nevertheless, have a number of suggestions to offer.

(a) Though the problem is by no means easy, some rules of the game by which public sector corporations can be judged must be established; one example would be a record of the gradual reduction over time of the ratio of domestic output prices relative to the international equivalent.

(b) Related to the evaluation of management performance should be some sort of incentive system by which better managers are rewarded and bad managers are fired.

(c) Wherever appropriate and necessary, management contracts should be resorted to as a part of government policy. Once we have such a system, any rule on corporate pricing at 10% above cost would make more sense than at present.

(d) No export bonus should be given, as is currently the case for jute manufacturers, by simply making up the deficit after the fact. This procedure does not provide the necessary incentives for efficient operation.

(6) Once a more realistic exchange rate is established and a measure of stabilization in prices is accomplished, non-traditional exports in the raw materials

area become feasible; it is hard to predict what exactly these might be, but shrimp and other fish are among those which might be mentioned. More importantly, and somewhat later, non-traditional labor intensive industrial exports will become feasible in such areas as textiles, woodworking, electronics assembly, etc. While it may seem premature to envision large numbers of export processing zones, followed by a gradually spreading decentralized labor intensive industrial output and export pattern overnight, it is by no means unrealistic to expect Bangladesh to ultimately become an important competitor in this area, a field vacated by Taiwan, Korea, Singapore, Hong Kong, etc. whose wages are rising as a consequence of the exhaustion of the labor surplus. Part of our longer term vision then would be the meshing of expanding rural industrial activity with subcontracting down from the export oriented industries of a kind which could have a very substantial future growth potential in Bangladesh.

IV. BANGLADESH'S PROSPECTS IN HISTORICAL PERSPECTIVE

A short term visitor to Bangladesh is struck by the current sense of disillusionment and cynicism among both civil servants and "men on the street" with whom one comes into contact. Why, the question is either explicitly or implicitly asked, are we no better off then we were before independence when we were being exploited by Pakistan. This is a very natural reaction, superimposed on the normal euphoria of all countries after independence. Nevertheless, a bit of historical perspective may be helpful. It needs to be remembered, even though it is obvious, that the Subcontinent has just undergone its second partition. Jut as in 1948 Pakistan complained about the loss of entrepreneurs, industry and civil servants to India, Bangladesh has now been deprived of a large portion of the total administrative talent, industrial infrastructure and managerial entrepreneurial capacity of undivided Pakistan. These losses cannot be expected to be made up overnight. Nevertheless, the industrial entrepreneurial potential among Bangalees is probably more substantial than that which Pakistan could count on in 1948. The realities of greater impatience are there, but so are the potentials residing mainly in the people and their nervous and creative energies.

The two-pronged strategy proposed here, and the more specific implementation proposals underlying it, are based on the assumption, previously stated, that the Government of Bangladesh is determined to use a pragmatic approach to achieve its stated ends. But it should also be quite clear that some of the measures suggested are as radical, i.e., as difficult to implement in terms of hurting some vested interests, as would be the thoroughgoing socialist alternative. It is not a question of tinkering with the price mechanism and following *laissez faire a la Chicago*, on the one hand, versus a major social revolution, on the other. A closer analysis of the policy package suggested here indicates the necessity for a rather substantial and painful shift in the nature of the development path. Some people are bound to get hurt in the short run; for example, civil servants' power will be somewhat eroded and the windfall profits of the higher income groups, both urban and rural, will be substantially reduced. But, in the longrun, all parties to the social contract should stand to benefit from the kind of strategy outlined here. The lower income groups clearly will have access to resources, to information, and to opportunities for employment hitherto undreamed of, so that working family incomes can begin to rise even while wage rates remain at relatively low levels reflecting the continuation of a general labor surplus condition. Once continued efficient labor absorption in both agricultural and non-agricultural rural activities—complemented by industrial activities in the export oriented urban sector—has succeeded in mopping up the labor surplus—as happened in Taiwan, for example, around 1970—income redistribution will become more pronounced. But it is important to note that long before that happens the possibility for an increased number of a family's workers to be employed, to work more hours and to experience the mobility associated with a switch from employee to small entrepreneurial status, should all clearly serve to assist the low income groups at an early stage of the evolution of the aforementioned strategy.

Note

The Supply Responsiveness of Bangalee Rice and Cash Crop Cultivators

by

John Thomas Cummings[*]

INTRODUCTION

As part of a subcontinent-wide study of the effects of various social, economic and political factors on the market responsiveness of cultivators, supply elasticities were calculated for several crops using a Nerlove-type supply model [3]. This approach has been applied on earlier occasions [2; 4] to the analysis of the major crops of Bangladesh—rice and jute—but these studies have only considered the country as a whole. In the context of the effort in which the work outlined herein was carried out, interregional differences in supply responsiveness were of prime interest. Therefore, the model was applied to analyze crop output on the division and district level, as well as for Bangladesh as a whole.

PART I—THE NERLOVE SUPPLY MODEL

In his seminal studies of the late 1950's, Marc Nerlove introduced concepts of both price expectation and output adaptation, each in response to past prices, to the problem of explaining output variation in market terms. His basic model has been used in the last fifteen years by dozens of authors, most of whom have made changes in the model of minor or major significance either to suit the particular situation under consideration or to ease the statistical estimating problems found in the original version.

In this study, the area that cultivators wish to devote to a particular crop is postulated to be a function, first, of expected prices at the time of post-harvest sales, then of expected water availability during critical periods, then finally of a trend variable:

$$(1) \quad A_t^D = a_1 + a_2 P_t^* + a_3 R_t^* + a_4 T + U_t$$

---

[*] The author is Assistant Professor of Economics at Tufts University.

The Nerlove price expectation and area adjustment equations complete the model:

$$(2)\quad P_t^* - P_{t-1}^* = b(P_{t-1} - P_{t-1}^*)$$

$$(3)\quad A_t - A_{t-1} = c(A_t^D - A_{t-1})$$

where: A_t^D is desired acreage;

P_t^* is expected price;

R_t^* is expected water availability;

T is the trend variable; and

A_t and P_t are actual acreage and price.

Thus, price expectations this year are adjusted relative to last year by some proportion of the difference between expectation and actuality last year, while actual area adjustment relative to last year is some proportion of the desired adjustment.

Equation (1) cannot be directly estimated since it contains unobservable variables. The estimating equation actually employed was:

$$\begin{aligned}(4)\quad A_t - (1-b)\,A_{t-1} = {} & a_1bc + a_2bc\,P_{t-1} + (1-c)(A_{t-1} - (1-b)\,A_{t-2}) \\ & + a_3c(R_t^* - (1-b)\,R_{t-1}^*) + a_4c(T - (1-b)\,(T-1)\,) \\ & + c(U_t - (1-b)U_{t-1}),\end{aligned}$$

which was obtained by substituting equations (2) and (3) into(1) and algebraically manipulating the result. In order to avoid a parameter indentification problem, the equation was then separately estimated for various values of the price expectation coefficient, b, which can be reasonably assumed to be between zero and two. Using a maximum likelihood approach, the value of b for which the regression error sum of squares is minimized is then chosen as the best estimate. Because of the presence of lagged values of the dependent variable on the right hand side of equation (4), the Cochrane-Orcutt [1] technique was employed in the ordinary least squares regression procedure in order to account for possible autocorrelation problems.

PART II—THE RESULTS

Analysis was made of the acreage planted annually in five crops—rice, jute, tobacco, rape and mustard seed, and sesamum, which together accounted for more than 88 percent of the cultivated area of Bangladesh in 1961/62. Since the actual prices paid to farmers were not available, published wholesale prices in the city closest to the district in question were used, and these were deflated by a cost of living index.[1] The expected availability of water was represented by an index comparing rainfall preceding and during the sowing period to the mean rainfall in the past during this interval. In Table I are shown the estimated supply parameters for each crop on a nation-wide basis, and in Table II, the corresponding price expectation and area adjustment coefficients and short- and long-run price elasticities are listed. For the sake of brevity, only the elasticity estimates are indicated in Table III for the division and district regressions.

As can be seen from Table I, positive price responsiveness is indicated nationally for all crops (save *kharif* sesamum), and all but one of the estimated price parameters is statistically non-zero at the 30 percent level or better. This is true even for rice, undeniably a homeconsumed product, though the resultant elasticities are notably lower than those calculated for cash crops. Our results yield approximately the same value for short-run elasticity calculated by Hussain[2] for Bangalee rice during a slightly shorter time period (1948 to 1963). In addition, for jute, the estimates in Table II are close to the short-run elasticities found in two other post-World War II studies of the crop—Rabbani[4] (1947 to 1963), and Hussain (1948 to 1963)—but somewhat less than Rabbani's long-run estimate (+0.66).

If we consider each crop in turn, the relatively small supply elasticity found nationally for rice is also indicated in the division and district calculations. However, though national price response was positive, about half of the statistically significant price parameters found for districts were negative. The latter estimates are clustered in two areas—along the southeastern coast (Chittagong, Noakhali and Tippera) and in the northwest (Bogra, Dinajpur, Rangpur and Rajshahi).[2]

For jute, the positive responsiveness found nationwide was duplicated in every division and district, with most short-run elasticities around +0.5 or more. The only pattern discernible among jute districts is that elasticities seem somewhat larger in those where the proportion of cultivated acreage devoted to jute is greater.[3]

---

[1] The index employed was computed for the urban working class. No rural cost of living index was available.

[2] In other work, a similar pattern of negative coefficients was found for adjoining districts in Assam and West Bengal. This was one of only two places in India (the other was in Himachal Pradesh) that displayed such a relationship for rice over several contiguous districts.

[3] Correlation coefficients were computed for the relationship between short-run elasticity and the proportion of the district in each crop in turn. The resulting value, however, was both small and negative: —0.24. A somewhat more significant degree of correlation was indicated between elasticity and the relativity crop fertility of each district's acreage—a value of +0.46.

Among the other three cash crops, all of which are minor compared to jute, tobacco claims the least acreage—less than one half of one percent of the cultivated area. However, its high returns per acre make it a very attractive crop. The relatively high positive elasticity indicated for the country as a whole is not backed up by the disaggregated tobacco regressions. Price coefficient estimates for all four divisions yield elasticities that are either close to or not significantly different from zero, and a similar situation prevails on the district level. Particularly telling is the lack of responiveness indicated for Rangpur district, where more than half the national crop is grown. This isolation from market influences might be explained by two factors: First, the rather specific soil conditions and other inputs needed for tobacco's successful cultivation, and second, the generally high relative price this crop receives in the market tends to keep most of the land suitable for its production in the crop at any given time, rather than utilized for any "second-best" activities.

Cultivators of Bengal's chief oilseed crop, rape and mustard seed, show a positive response to market impulses, a tendency generally borne out as well on the division and district level. Though many district regressions indicated little statistical significance for the price parameter estimate, those calculated for the districts with the greatest proportion of acreage in rape and mustard seed[1] were both positive and staistically significant.

For the other major oilseed, sesamum, a more complex pattern emerges, mostly because figures for both *kharif* and *rabi* plantings allowed regression analysis of both crops. In each division where both seasons are significant, as well as for the nation itself, a negative price response was estimated for one crop and positive for the other. In three divisions, a positive price to acreage relationship was found for the more important season—*kharif* in Dacca and Khulna, *rabi* in Chittagong and negative in the lesser case.[2] But neat generalizations based on this outcome are ruled out by the contrary result indicated in the nationally based[3] analysis, as well as for Rajshahi division where both plantings are relatively important.

---

[1] Rangpur, Bogra, Dinajpur and Mymensingh.

[2] Except for Khulna division, where so little *rabi* sesamum is cultivated that no supply analysis was made.

[3] For which *kharif* sesamum is about twice as extensive as *rabi*.

PART III—SUMMARY AND CONCLUSION

Bangladesh includes some of the richest agricultural acreage in the world—soils which are the gift of two of the world's greatest rivers. But she shares with two other highly fecund regions—the Nile Valley and the island of Java—the dubious distinction of being the planet's most densely populated farm economies. As a result of such demographic pressures, the agricultural sector can hardly be anything but of an overwhelmingly subsistence nature.

The truth of such a categorization generally leads to conclusions that cultivators are fairly isolated from market impulses when they make their planting decisions. But our supply analysis, on three different geographic levels, does not indicate such isolation. Bangalee cultivators of cash crops are certainly sensitive to prices,[1] and even rice is not cut off from the influence of the market. Rice supply elasticities may be smaller than those of the other crops analyzed, but they are generally positive.

If Bangalee cultivators are market orientated, though certainly aware of their own family subsistence needs, then agricultural policies which hope to expand crop output should take this into account. The larger study, of which the results reported herein are part, is aimed at an identification of major influences on the magnitude of demonstrated elasticities. The importance of these continuing efforts to determine what makes farmers produce more in response to market forces is obviously increased by preliminary findings that they are in fact sensitive to the market.

---

[1] With the exception of the possibly special case of tobacco, as indicated above.

TABLE I

SUPPLY MODEL ESTIMATED PARAMETERS

Crop	Time Period	Constant	Price	Lagged Area	Rainfall	Trend	R^2
Rice	1949—1968	$+4061.7^b$ (2.07)	$+120.8^d$ (3.04)	$+0.295^b$ (1.80)	$+10.28^c$ (2.97)	$+185.9^d$ (3.27)	0.65
Jute	1947—1968	$+595.5^a$ (1.08)	-25.13^d (3.70)	$+0.158$ (0.64)	-1.625^a (1.30)	$+37.77^a$ (1.33)	0.65
Tobacco	1951—1968	$+106.3^d$ (4.09)	$+0.563$ (1.02)	$+0.060^c$ (2.27)	$+0.007$ (0.26)	$+0.289$ (0.21)	0.77
Rap & Mustard	1950—1962	$+238.5^a$ (1.40)	-3.270^a (1.44)	$+0.448^b$ (2.09)	-1.921^d (3.63)	-4.743^b (2.00)	
Sesamum (*robi* crop)	1953—1964	$+10.74$	$+0.322^d$	$+0.651^d$	-0.010	$+0.003$	0.91
(*kharif* crop)	1963—1964	$+241.1^c$ (3.02)	-0.722^d (6.25)	-0.379 (0.87)	-0.145 (1.04)	-3.082^d (5.34)	0.64

Notes : Figures in parentheses are t-values.
(a) 30 percent significance level.
(b) 10 percent significance level.
(c) 5 percent significance level.
(d) 1 percent significance level.

TABLE II

EXPECTATION AND ADJUSTMENT COEFFICIENTS AND SUPPLY ELASTICITIES

Crop	Price Expectation Coefficient	Area Adjustment Coefficient	Short-run Elasticity	Long-run Elasticity
Rice	+0.5	+0.70	+0.13	+0.19
Jute	+1.1	+0.84	+0.40	+0.48
Tobacco	+1.1	+0.97	+0.51	+0.53
Rape and Mustard	+1.0	+0.55	+0.23	+0.42
Sesamum (*rabi* crop)	+1.3	+0.35	+0.21	+0.60
(*kharif* crop)	+1.5	+1.38	—0.28	—0.20

TABLE III

DIVISION AND DISTRICT ELASTICITY ESTIMATES

Region	Elasticity		Region	Elasticity	
	Short-run	Long-run		Short-run	Long-run
Rice					
Chittagong	—0.06[a]	—0.07	Khulna	+0.20[d]	+0.29
Dacca	+0.16[d]	+0.21	Rajshahi	+0.13[b]	+0.33
	*	*	*	*	*
Bakerganj	+0.13[c]	+0.17	Kushtia	+0.05	+0.11
Bogra	—0.16[b]	—0.22	Mymensingh	+0.03	+0.02
Chittagong	—0.18[a]	—0.39	Noakhali	—0.39[d]	—0.35
Chittagong Hill Tracts	+0.36[a]	—0.27	Pabna	+0.12[b]	+0.15
Dacca	+0.20[a]	+0.24	Rajshahi	—0.13	—0.16
Dinajpur	—0.19[b]	—0.26	Rangpur	—0.12[a]	—0.16
Faridpur	—0.25[a]	—0.30	Sylhet	+0.17[c]	+0.21
Jessore	+0.05	+0.05	Tippera	—0.08	—0.09
Khulna	+0.10	+0.12			
Jute					
Chittagong	+0.36[b]	+0.44	Khulna	+0.45[c]	+0.56
Dacca	+0.38[c]	+0.69	Rajshahi	+0.50[c]	+0.75
	*	*	*	*	*
Bakerganj	+0.44[a]	+0.58	Mymensingh	+0.46[d]	+0.60
Bogra	+0.46[c]	+0.84	Noakhali	+0.58[c]	+0.46
Dacca	+0.25[a]	+0.25	Pabna	+0.51[c]	+1.76
Dinajpur	+0.42[b]	+0.49	Rajshahi	+0.78[d]	+7.09

(Contd.)

TABLE III (Contd.)

Region	Elasticity		Region	Elasticity	
	Short-run	Long-run		Short-run	Long-run
Faridpur	+0.12	+0.13	Rangpur	+0.54[d]	+0.70
Jessore	+0.17	+0.20	Sylhet	+0.27	+0.49
Khulna	+0.51[c]	+0.76	Tippera	+0.33[a]	+0.52
Kushtia	+0.01[c]	+7.21			
Tobacco					
Chittagong	+0.02[b]	+0.06	Khulna	—0.21	—0.28
Dacca	+0.16[a]	+0.14	Rajshahi	—0.09[a]	—0.12
*	*	*	*	*	
Bakerganj	—0.43[a]	—0.43	Khulna	+0.02	+0.03
Chittagong	+0.26	+0.68	Mymensingh	+0.13	+0.27
Dacca	+0.25	+0.34	Rangpur		
Faridpur	+0.14[b]	+0.19	Sylhet	+0.36	+0.53
Rape and Mastard					
Chittagong	+0.11	+0.15	Khulna	—0.06	—0.06
Dacca	+0.21	+0.34	Rajshahi	+0.36[c]	+0.29
*	*	*	*	*	
Bogra	+0.81[d]	+0.80	Kushtia	+0.20	+0.47
Chittagong Hill Tracts	—0.26	—0.20	Mymensingh	+0.35[a]	+5.83
Dacca	—0.15	—0.12	Pabna		
Dinajpur	+0.37[d]	+0.70	Rajshahi	+0.15	+0.09
Faridpur	+0.18	+0.32	Rangpur	+0.43[a]	+0.52

(Contd.)

TABLE III (Contd.)

Region	Elasticity		Region	Elasticity	
	Short-run	Long-run		Short-run	Long-run
Jessore	+0.13	+0.17	Sylhet	+0.20[a]	+0.45
Khulna			Tippera	—0·10	—0.14
Sesamum (*rabi* crop)					
Chittagong	+0.36[d]	+0.35	Khulna	+0.11	+0.10
Dacca	+0.39[a]	+0.30	Rajshahi	+0.26[c]	+1.00
(*kharif* crop)					
Chittagong	—0.02	—0.02	Rajshahi	—0.20[a]	—0.32
Dacca	+0.02	+0.02			

Notes : Significance level of price parameter estimate from which elasticities are derived:

(a) 30 percent
(b) 10 percent
(c) 5 percent
(d) 1 percent.

REFERENCES

1. Cochrane, J. D. and G. H. Orcutt, "Application of Least Squares Regressions to Relationships Containing Auto-Correlated Error Terms", *Journal of the American Statistical Association* (1949).

2. Hussain, S. M., "The Effect of the Growing Constraint of Subsistence Farming on Farmer Response to Price: A Case Study of Jute in Pakistan", *The Pakistan Development Review* Vol- IX (Autumn, 1969).

3. Nerlov, M., *The Dynamics of Supply : Estimation of Farmers' Response to Price,* Baltimore: John Hopkins University Press (1958).

4. Rabbani, A. K.M. Ghulam, "Economic Determinants of Jute Production in India and Pakistan", *The Pakistan Development Review*, Vol. V (Summer 1965).

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS
(Organ of the Indian Society of Agricultural Economics)

Volume XXIX April-June 1974 No. 2

CONTENTS

Articles

Research Notes

Individual Membership Fee : Rs. 25 or £ 3.50 or $ 8.00 Post free

Institutional Membership/
Subscription—Post free Rs. 40 or £ 5.00 or $ 12.00.

Subscription and orders for back numbers should be addressed to:
The Hon. Secretary, The Indian Society of Agricultural Economics,
46-48 Esplanade Mansions, Mahatma Gandhi Road, Fort,
Bombay-400 023 (India).

ARTHAVIKAS

Biannual Journal of Economic Development

Vol. X January 1974 No. 1

CONTENTS

Articles

Notes

Subscription Rates (inclusive of postage):

Annual:	Rs. 12.00; $ 4.00
Single Issue:	Rs. 7.00; $ 2.50

Please address all correspondence to:

Dr. Mashesh Pathak, Managing Editor,
Artha Vikas, Department of Economics, Sardar Patel University,
Vallabh Vidyanagar (388120), Gujarat, India.

THE DEVELOPING ECONOMIES

Quarterly Journal of
Institute of Developing Economies
42, Ichigaya-Hommura-Cho, Shinjuku-Ku Tokyo,
Japan

Volume XI **September 1973** **Number 3**

Subscription price (4 issues): $ 26.00 (post free)
Single copies: Ordinary issue $ 6.00;
Special issue $ 8.00 (post free)

Order may be Sent to the Sole Agent:
MARUZEN COMPANY, LTD.,
P. O. Box 5050, Tokyo International 100-31, Japan.

SUBSCRIPTION RATES

for

THE BANGLADESH DEVELOPMENT STUDIES

Effective from January 1975

INLAND:	FOREIGN:
General	**Annual**
Taka 7.50 per issue	US $ 15.00 or UK £ 6.00 or
Taka 30.00 per year	equivalent thereof in other currencies
Students	**Single copy**
Taka 4.50 per issue	US $ 3.75 or UK £ 1.50 or
Taka 18.00 per year	equivalent thereof in other currencies

Air postage extra. Payments to be made through bank drafts/postal orders.

Special Publications

Report on the Seminar on Industrialization and Labour Management Relations held in Karachi in January 1959 (Tk. 3.00 or US $ 1.00) Editor: *M. L. Qureshi*

Population Growth and Economic Development with Special Reference to Pakistan (Tk. 10.00 or US $ 4.00) Editor: *M. L. Qureshi*

Deficit Financing and Capital Formation: The Pakistan Experience, 1951—59 (Tk. 5.00 or US $ 2.00) *By Parvez Hasan*

Partition, Integration, Economic Growth, And Interregional Trade: A Study of Interwing Trade in Pakistan: 1948-1959 (Tk. 7.50 or US $ 3.00) *By Dr. Akhlaqur Rahman*

The Economy of Pakistan: A Select Bibliography, 1947—62 and 1963—65, 2 Vols. (Tk. 5.00 or US $ 2.00 each) *By A. H. Siddiqui*

A Bibliography of Pakistan Demography (Tk. 3.00 or US $ 1.00) *By A. D. Bhatti*

Seminar Report on the Current Economic Problems of Pakistan (Tk. 5.00 or US $ 2.00)

The Problems of Teaching Economics in Pakistan (Tk. 5.00 or US $ 2.00) *By E.A.G. Robinson*

A Report of the Seminar on Population Problems in the Economic Development of Pakistan (Tk. 5.00 or US $ 2.00)

Studies in the Demography of Pakistan (Tk. 12.50 or US $ 5.00) Editor: *Dr. W. C. Robinson*

Analytical Techniques for Development Planning: A Case Study of Pakistan's Third Five Year Plan (1965—70) (Tk. 15.00 or US $ 6.00) *By Wouter Tims*

Small and Medium Industries of Pakistan: A Select Bibliography, 1948—62 *By A. Hafiz Akhtar*

Symposium on Planning Experience in Pakistan (Tk. 2.00 or US $ 1.00) Editor: *Dr. A. R. Khan*

Report of the Population Growth Estimation Experiment: Description and Some Results for 1962—1963 (Tk. 6.00 or US $ 2.50)

Final Report of the Population Growth Estimation (Tk. 10.00 or US $ 4.00) Edited By : *M. N. I. Farooqui and G. M. Farooq*

Readings in Development Economics

No.1 Studies on the Strategy and Technique of Development Planning Edited By : *Dr. Azizur Rahman Khan*
(Paperback: Tk. 10.00 or US $ 4.00; Cloth Bound: Tk. 19.00 or US $ 7.50)

No.2 Studies on Commercial Policy and Economic Growth Edited By : *Prof. Nurul Islam*
(Paperback: Tk. 15.00 or US $ 6.00; Cloth Bound: Tk. 25.00 or US $ 10.00)

No.3 Empirical Studies on Pakistan Agriculture Edited By *S. M. Hussain* and *M. I. Khan*
(Paperback: Tk. 15.00 or US $ 6.00; Cloth Bound: Tk. 25.00 or US $ 10.00)

No.4 Studies on Fiscal and Monetary Problems Edited By *Swadesh R. Bose*
(Paperback: Tk. 12.50 or US $ 5.00; Cloth Bound: Tk. 20.00 or US $ 8.00)

Research Monographs

No.1 Bangladesh: National Income and Expenditure 1949/50—1969/70 *By Mohiuddin Alamgir* and *Lodewijk J. J. B. Berlage*
(Soft Cover: Tk. 20.00 or US $ 7.50; Hard Cover: Tk. 30.00 or US $ 10.00)

No.2 Saving in Bangladesh 1959/60—1969/70 *By Mohiuddin Alamgir* and *Atiqur Rahman*
(Soft Cover: Tk. 20.00 or US $ 7.50; Hard Cover: Tk. 30.00 or US $ 10.00).

PUBLICATIONS OF
THE BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES
DACCA, BANGLADESH

Quarterly Journal

The Pakistan Development Review: Vol. I—X (Price Tk. 12.00 or US $ 5.00 per vol.)
(Suspended from January 1971)

The Bangladesh Economic Review: Vol. I & II—No. 1 & 2 (price Tk. 30.00 or US $ 15.00)
(Suspended from July 1974)

The Bangladesh Development Studies:
(Annual Subscription: Inland Tk. 30.00; Foreign US $ 15.00 or UK £ 6.00)

Monographs in the Economics of Development (Tk. 5.00 or US $ 2.00 each)

No.1	A Study of Planning Methodology with Special Reference to Pakistan's Second Five Year Plan	*By Dr. J. C.* N. *Fei* and *Dr. G. Ranis*
No.2	Towards the Application of Interregional Input-Output Models to Economic Planning in Pakistan	*By S. M. Naseem*
No.3	Deficit Financing in Pakistan, 1951—60	*By Dr. M. Haq & Miss Khadija Khanam*
No.4	A Measure of Inflation in Pakistan, 1951—60	*Monetary* and *Fiscal Section*
No.5	Industrial Efficiency and Economic Growth: A Case Study of Karachi	*By Dr. G. Ranis*
No.6	Urban Consumer Expenditure and the Consumption Function	*By Dr. G. Ranis*
No.7	Problems of Budgetary Reform in Pakistan	*By Mrs. N. Sarfraz*
No.8	Wages and Prices in Karachi : A Case Study	*By A. R. Khan*
No.9	An Analysis of the Long-Run Prospects of Economic Development in Pakistan	*By Dr. J. C.* N. *Fei* and *others*
No.10	Liquidity and Lending: Volume of Bank Credit in Pakistan	*By R. C. Porter*
No.11	The Pakistan Export Bonus Scheme	*By Dr.* N. *J. Bruton* and *S.* R. *Bose*
No.12	The Use of Agricultural Surplus Commodities for the Economic Development of Pakistan	*By Dr. C. Beringer* and *Irshad Ahmed*
No.13	The People of Karachi: Demographic Characteristics	*By Sultan S. Hashmi*
No.14	Social Characteristics of the People of Karachi	*By Imtiazuddin Husain* and *others*
No.15	The People of Karachi: Economic Characteristics	*By G. Mumtaz Farooq*
No.16	Relative Price Changes and Industrialization in Pakistan, 1951—64	*By Dr. Stephen* R. *Lewis Jr.* and *S. Mushtaq Hussain*
No.17	Population Projections for Pakistan, 1960—2000	*By Lee* L. *Bean* and *others*

Statistical Papers

No.1	Acreage, Production and Prices of Major Agricultural Crops of West Pakistan (Punjab): 1931—59 (Tk. 5.00 or US $ 2.00)	Compiler *A. Rab*
No.2	The People of Karachi: Data from A Survey (Tk. 20.00 or US $ 8.00)	*By Dr. Sultan S. Hashmi* and *others*
No.3	Imports of Pakistan: Growth and Structure—A Statistical Study (Tk. 10.00 or US $ 4.00)	*By Prof. Nurul Islam*

(See Overleaf)

Printed at ABCO PRESS, 6-7 **Aulad Hossain Lane,** Dacca-1 and published
by the Bangladesh Institute of Development Studies, Dacca.